

CERCOSPORA AND ALLIED GENERA OF SINGAPORE AND THE MALAY PENINSULA

by

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INTRODUCTION

The genus *Cercospora* and allied genera are represented by a great number of species which cause leaf spot disease on a wide range of host plants. They are responsible for much damage to economic plants such as cereals, grasses, vegetables, forest trees and ornamentals and are important plant pathogens.

The diseased spots on the leaves vary in shape and size and are generally coloured pale brown to brown. Under humid conditions, abundant conidia are formed on the necrotic spots. Conidiophores appear as tufts or fascicles, arising from the lesion surface or through the stomata in the diseased areas. The perfect stage has not been encountered so far in the collections examined and described here.

Since the genus *Cercospora* was established by Fresenius in 1863, numerous species have been recorded and described by mycologists and phytopathologists. The monograph by Chupp (1954) is a valuable reference source, and Deighton's many studies (1967, 1971, 1973) have added considerably to the elucidation of this interesting group of fungi. More recently, Deighton (1976) has redescribed a number of *Cercospora*-like species and estimated that some 2000 species names have been published to date in the genus *Cercospora*, which is a heterogenous genus and one of the largest of the Hyphomycetes.

The number of species described here totalled 98, of which 72 species have been described and published previously by the authors as new *Cercospora* species. This publication brings together their reports published in various journals, which are now translated from French into English here. The recent studies by Deighton (1976) make it necessary for certain revisions and changes to the generic names of some species previously published as *Cercospora* species. This communication updates the authors' previous reports and facilitates access to information on the prevalent leaf spot diseases affecting host plants in this region caused by this group of fungal pathogens.

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1. *Cercoseptoria balsaminicola* (Yen & Lim) Yen, comb. nov. (Fig. 1, A, B & E)

= *Cercospora balsaminicola* Yen & Lim, Cahiers du Pacifique 14:90, 1970a.

Leaf spots amphigenous, distinct, circular, pale brown to brown, dispersive or confluent, 1–7mm in diam. Fruiting amphigenous, visible as minute black pustules on both sides of the spots. Stromata well developed, black brown, globose or subglobose, 20–60 μ m in diam. Fascicles present, dense to very dense, emerging through the stomata. Conidiophores olivaceous brown, erect or slightly flexuous, continuous or 1-septate, not geniculate, tip irregularly rounded, conidial scars indistinct, 10–27.5 x 2.5–3.5 μ m. Conidia very thin, acicular or filiform, hyaline, usually curved, 1–8 septate, tip acute, base cylindrically truncate, 45–132 x 2–2.5 μ m.

Habitat: On leaves of *Impatiens balsamina* (Balsaminaceae), Bukit Timah, Singapore, leg. G. Lim, Mar. 12, 1969.

Note: This fungus differs from others (*Cercospora fukushiana* (Mats.) Yamam. and *C. balsaminiana* Yen & Lim) by its very thin filiform conidia.

2. *Cercoseptoria ixoriana* (Yen & Lim) Yen, comb. nov. (Fig. 2)

= *Cercospora ixoriana* Yen & Lim, Bull. Soc. Mycol. Fr. 85:469, 1969.

Leaf spots amphigenous, circular, whitish gray, surrounded by brown border, scattered, 5–16mm in diam., sometimes confluent. Fruiting strictly hypophyllous, appearing as black minute pustules under the hand lens. Stromata globose, brown to black brown, 30–48 μ m in diam. Fascicles dense to very dense. External hyphae strictly hypophyllous, emerging through the stomata, pale olivaceous brown, septate, branched, 2.5–3.5 μ m in width. Conidiophores either from fascicles or arising from external hyphae, erect or flexuous, simple or sometimes branched, olivaceous brown, 0–2(–3) septate, 0–2 geniculate, tip irregularly rounded, conidial scars indistinct, 16–40(–48) x 3–3.5 μ m. Conidia strictly filiform, pale olivaceous brown, straight or slightly curved, 3 septate, apex rounded, base cylindrically truncate, 36–109 x 2.5–3.5 μ m.

Habitat: On leaves of *Ixora chinensis* (Rubiaceae), Singapore, leg. G. Lim, Aug. 2, 1969.

Note: *Pseudocercospora ixoricola* (Yen) Yen differs from this fungus by its angular and strictly vein-limited leaf spots and its obclavate conidia; furthermore it has no external hyphae and developed stromata.

3. *Cercoseptoria polygonigena* (Yen) Yen, comb. nov. (Fig. 3)

= *Cercospora polygonigena* Yen, Revue de Mycol. 42:143, 1978.

Leaf spots distinct, soil-brown with an indefinite yellowish border, irregularly circular, scattered. 2–7mm in diam., sometimes up to 20mm in length. Fruiting amphiphylous, but more abundant on the lower side of the leaf. Fascicles poor to meagre (2–10 stalks), emerging through the stomata. Conidiophores amphigenous, simple, rarely branched, straight or slightly tortuous, pale olivaceous brown, 0–2 septate, 0–1 geniculate, tip slightly attenuate and truncate, conidial

scars inconspicuous, $10-65 \times 3-3.5 \mu\text{m}$. Conidia very thin, filiform, pale olivaceous brown, straight or slightly curved, 3-7 septate, tip conic, base cylindrically truncate, $30-90 \times 2-3 \mu\text{m}$.

Habitat: On leaves of *Polygonum* sp. (Polygonaceae), Bukit Timah (Hwa Chung College), Singapore, leg. Chuan-ling Yen, Apr. 15, 1973.

Note: *Cercospora avicularis* Winter and *Cercospora polygonicola* Kar & Manal are different from this species by their obclavate conidia.

4. *Cercoseptoria rhododendricola* (Yen) Deighton (Fig. 4)

= *Cercospora rhododendricola* Yen, Revue de Mycol. 31:137, 1966.

Leaf spots angular or irregular, vein-limited, with an indefinite border, dark brown on upper side, yellowish brown on under side, 1.5-3mm in diam., frequently confluent and forming large patches. Fruiting strictly epiphyllous, appearing as minute black pustules under the hand lens. Stromata black brown, globular or irregularly globular, $30-60 \mu\text{m}$ in diam. Fascicles dense to very dense, filling the stomatal opening. Conidiophores epigenous, simple, straight or slightly flexuous, 0-1 geniculate, generally continuous, rarely 1-2 septate, tip irregularly rounded or laterally shouldered, conidial scars inconspicuous, $18-26 \times 2.4-3 \mu\text{m}$. Conidia filiform or acicular, pale olivaceous brown, generally slightly curved, 3-6 septate, tip obtuse, base slightly attenuate and truncate, $54-96 \times 2-2.5 \mu\text{m}$.

Habitat: On leaves of *Rhododendron* sp. (Ericaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 112), Apr. 13, 1965.

Note: *Cercospora handelii* Bubak is distinct from this species by its bigger and not vein-limited leaf spots (2-10mm in diam.) and its amphigenous fruiting.

5. *Cercoseptoria tecomae-heterophyllae* (Yen) Yen, comb. nov. (Fig. 5)

= *Cerospora tecomae-heterophyllae* Yen, Revue de Mycol. 31:143, 1966.

Leaf spots very small, circular, whitish and surrounded by a brown margin, scattered or coalescing to form large patches, 0.2-1mm in diam. Fruiting amphigenous, more abundant on the upper side, appearing as minute black pustules under the hand lens. Stromata generally epigenous, black brown, globose or irregularly globose, $36-90 \mu\text{m}$ in diam. Fascicles dense to very dense, emerging through rupture of the epidermis. External hyphae generally hypogenous, emerging through the stomata, pale olivaceous brown, septate, branched, $1.5-3 \mu\text{m}$ in width. Conidiophores showing two types: A, conidiophores coming from fascicles, pale olivaceous brown, straight or flexuous, simple (never branched), 0-3 geniculate, 0-3 septate, unthickened small conidial scars at the attenuate and truncate tip, $25-48 \times 3-4.5 \mu\text{m}$; B, conidiophores arising from external hyphae, pale olivaceous brown, single, straight or slightly tortuous, 1-2 geniculate, 0-2 septate, tip attenuate and truncate $12-45 \times 3-4 \mu\text{m}$. Conidia filiform or acicular, very pale olivaceous brown, or subhyaline, slightly curved, 2-6 septate, tip obtuse or rounded-obtuse, base slightly truncate and cylindrical, $36-72 \times 1.5-2.5 \mu\text{m}$.

Habitat: On leaves of *Tecoma heterophylla* (Bignoniaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 115), Apr. 13, 1965.

Note: This fungus is distinct from others (*Cercospora tecomae* Chupp & Viegas and *C. stenolobiiicola* Chupp) by its thin conidia.

6. *Cercoseptoria tecomicola* (Yen) Yen, comb. nov. (Fig. 6)

= *Cercoseptoria tecomicola* Yen, Revue de Mycol. 32:196, 1967a.

Leaf spots distinct, angular or irregularly angular, strictly vein-limited, brown to dark brown, scattered, 0.5–4mm in diam. Fruiting amphigenous, visible as minute black pustules on the upper surface of the leaf, appearing as gray velvet on the lower side of the leaf spots. Stromata epigenous, at times lacking, dark brown to black brown, globose, 30–55 μ m in diam. Fascicles medium to dense or very dense. External hyphae hypophyllous, emerging through the stomata, pale brown, septate, branched, 2–3 μ m in width. Conidiophores showing two types: A, conidiophores coming from fascicles, pale brown, paler towards the apex, erect or flexuous, simple or branched, 0–3 septate, 0–3 geniculate, tip rounded or laterally shouldered, 21.5–49 x 3–4.8 μ m; B, conidiophores arising from the external hyphae, pale olivaceous brown, single, 0–1 septate, 0–1 geniculate, tip rounded or laterally shouldered, 6–19.5 x 2.5–4.5 μ m. Conidia cylindrical or acicular, pale olivaceous brown, slightly curved, 1–9 septate, tip subrounded, base cylindrical and truncate, 18–79 x 2.5–3 μ m.

Habitat: On leaves of *Tecoma stans* (*Stenolobium stans*) (Bignoniaceae), Katong, Singapore, leg. Jo-min Yen (No. M.S. 771), Jan. 5, 1966.

Note: *Cercospora stenolobiiicola* Chupp differs from this species by its hyaline conidia and *Cercoseptoria tecomae-heterophyllae* (Yen) Yen is distinct from this fungus by its very small (0.2–1mm in diam.) and not vein-limited leaf spots.

7. *Cercospora abacopteridis* Yen & Lim (Fig. 7, C-E)

Cahiers du Pacifique 17:96, 1973.

Leaf spots amphigenous, brown with an indefinite border, at first vein-limited, then confluent. Fruiting hypophyllous, invisible. Stromata lacking, fascicles poor to midly dense (2–18 stalks), emerging through the stomata. Conidiophores dark brown, paler towards the apex, always simple, erect or slightly flexuous, 1–5 septate, with 0–2 small geniculations, a large black brown conidial scar at the rounded tip, 15–118 x 4–5 μ m. Conidia acicular or filiform, hyaline, straight or slightly curved, 1–35 septate, tip acute, base cylindrical-truncate with a black brown scar at its end, 62–400 x 2–4 μ m.

Habitat: On leaves of *Abacopteris urophylla* (Pteridophyte), Singapore, leg. G. Lim (No. 71), Mar. 3, 1972.

8. *Cercospora acori* Yen (Fig. 8)

Revue de Mycol. 29:209, 1964.

Leaf spots indistinct, sometimes appearing as gray darkish specks. Fruiting amphigenous, effuse, dark brown, Stromata lacking. External hyphae brown or yellowish brown, branched, septate, 2.5–4.8 μ m in width. Conidiophores as single branches from procumbent threads, never fasciculate, brown or dark brown, cylindrical, not geniculate, 2–6(–8) septate, tip rounded to conic, several small brown scars on the upper part, 21–190 x 4–4.8 μ m. Conidia pale olivaceous brown, obclavate or obclavatoacicular, 4–9(–12) septate, tip acute, base obconically truncate, 40–120 x 2.3 μ m.

Habitat: On leaves of *Acorus calambus* (Araceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 7), Jan. 26, 1964.

Note: This fungus is parasitic on the uredospores of *Uromyces aparganii* Clint. & Peck which is parasitic on the same host plant at the same time.

9. *Cercospora apii* Fres.

Beitr. Myk. 3:91, 1863.

Syn. *Cercospora penicillata* var. *apii* Fuckel, Hedwigia 2:132, 1863.

Leaf spots subcircular to irregular, brownish to ashy gray, surrounded by an indistinct greenish border, 1–5mm in diam., often confluent. Fruiting amphigenous, invisible. Stromata lacking or very small. Fascicles very poor. Conidiophores olivaceous brown, simple, straight or slightly flexuous, 2–6 septate, not geniculate, a large black brown scar at the rounded tip, 50–220 (–300) x 4–6 μ m. Conidia filiform, acicular, hyaline, straight or curved, multiseptate, tip acute to subacute, base truncate, 35–210 (–300) x 2–3.5 μ m.

Habitat: On leaves of *Apium graveolans* (Umbelliferae), Bukit Timah, Singapore, leg. G. Lim, Apr. 25, 1969.

Distribution: N. America, Europe, India, Korea, Japan, Manchuria and Singapore.

10. *Cercospora asystasiana* Yen (Fig.9)

Revue de Mycol. 32:180, 1967a.

Leaf spots orbicular, brown with an indefinite border, scattered, 2–5mm in diam., sometimes confluent. Fruiting strictly hypophyllous, invisible. Stromata absent, sometimes present but very rudimentary. Fascicles very poor (2–5 stalks), emerging through the stomata. Conidiophores hypogenous, simple, straight or tortuous, dark brown, with 0–5 small geniculations, 0–5 septate, a large black brown conidial scar at the rounded tip, several small scars on the upper part, 30–132 x 3–3.5 μ m. Conidia hyaline, acicular or obclavato-cylindrical, mildly curved, 5–20 septate, tip acute to obtuse, base subtruncate and with a black brown scar at the end, 48–185 x 2.5–5 μ m.

Habitat: On leaves of *Asystasia chelonoides* (Acanthaceae), Botanic Gardens, Singapore, leg. Jo-min Yen (No. M.S. 769), Jan. 5, 1966.

Note: This fungus is different from *Pseudocercospora asystasiae* (Yen) Yen by its hypophyllous fruiting and hyaline conidia.

11. *Cercospora balsaminiana* Yen & Lim (Fig. 1, C & D)

Cahiers du Pacifique 14:91, 1970a.

Leaf spots none or indistinct. Fruiting epigenous, invisible. Stromata absent or very rudimentary, consisting of few brown cells. Fascicles very poor (2–7 stalks), emerging through the stomata. Conidiophores pale brown, always simple, cylindrical, erect, usually continuous, sometimes 1 septate, a large dark brown conidial scar at the rounded tip, 15–40 x 4.5–6 μ m. Conidia acicular, hyaline, straight or slightly curved, 5–17 septate, tip acute, base truncate and with a black brown scar at the end, 66–307 x 2.5–4.5 μ m.

Habitat: On leaves of *Impatiens balsamina* (Balsaminaceae), Bukit Timah, Singapore, leg. G. Lim, Mar. 12, 1969.

Note: *Cercospora fukushiana* (Mats.) Yamam. differs from this fungus by its amphiphylous fruiting and its 1-4 septate conidiophores.

12. *Cercospora barleriae* Yen & Lim (Fig. 10)

Cahiers du Pacifique 17:100, 1973.

Leaf spots amphigenous, angular, vein-limited, black on the upper side and dark brown on the under side, usually confluent and forming large black brown patch, sometimes extending over a great part of the leaf surface. Fruiting strictly hypophyllous, effuse, visible as dark brown velvet on the under side of spots. Stromata absent. Fascicles poor to mildly dense (2-18 stalks), emerging through the stomata. Conidiophores olivaceous brown, paler towards the tip, simple, rarely branched, flexuous, 1-7 septate, with 0-3 small geniculations, apex slightly attenuate and truncate, with brown conidial scar at the end, 25-130 x 5-6 μ m. Conidia pale olivaceous brown, obclavate or obclavato-cylindrical, straight or slightly curved, 1-8 septate, tip rounded or subobtuse, base slightly attenuate and truncate, 13-80 x 4-5 μ m.

Habitat: On leaves of *Barleria cristata* (Acanthaceae), Singapore, leg. G. Lim (No. S.U. 73), Jan. 5, 1971..

Note: *Cercospora barlericola* Payak and *C. barleriae-cristatae* Gov. & Thir. are different from this fungus by their amphiphylous fruiting and hyaline conidia.

13. *Cercospora canavaliiana* Yen & Lim (Fig. 11, A-F)

Cahiers du Pacifique 14:94, 1970a.

Leaf spots distinct, medium brown on the upper side, grayish brown on the lower side, irregularly orbicular, 3-25 mm in diam. Fruiting amphigenous, but chiefly hypophyllous. Stromata absent or very rudimentary. Fascicles poor to medium (2-12 stalks), emerging through the stomata. Conidiophores olivaceous brown, simple, cylindrical, always erect, not geniculate, continuous (rarely 1 septate), a large black brown conidial scar at the rounded and paler tip, 36-80 x 5-6 μ m. Conidia cylindrical or filamentous, hyaline, slightly curved, 3-10 septate, apex rounded, base truncate with a black brown scar at the end, 60-200 x 2.5-4.8 μ m.

Habitat: On leaves of *Canavalia gladiata* (Leguminosae), Bukit Timah, Singapore, leg. G. Lim, Apr. 5, 1969.

Note: This species differs from others (*Cercospora canavaliae* Syd. and *C. canavaliicola* Saw. & Kats.) by its amphiphylous fruiting and filiform conidia.

14. *Cercospora canescens* Ell. & Mart.

Amer. Nat. 16:1003, 1882.

Syn. *Cercospora vignicaulis* Tehon, Mycologia 29:436, 1937.

Cercosporiopsis canescens (Ell. & Mart.) M. Miura, South Manch. Railway Co. Agr. Rept. 27:529, 1928.

Leaf spots amphigenous, suborbicular to irregular, reddish brown with an indefinite border, at times vein-limited, 1.5–15mm in diam., sometimes confluent. Fruiting amphigenous, more abundant on lower side, invisible. Stromata very poor. Fascicles poor to dense (2–25 stlks), emerging through the stomata. Conidiophores may be divided into two kinds: A, conidiophores from fascicles simple, erect or slightly flexuous, olivaceous brown, 0–7 septate, 0–3 geniculate, a large black brown conidial scar at the rounded tip or somewhat laterally displaced, $28.8\text{--}174 \times 4\text{--}5\mu\text{m}$; B, conidiophores arising from external hyphae, simple, erect, olivaceous brown, continuous, a small conidial scar at the rounded tip, $2.4\text{--}12 \times 3.6\text{--}5\mu\text{m}$. Conidia hyaline, acicular, straight or curved, 3–18 septate, tip acute, base truncate and a black brown scar at the end, $75\text{--}190 \times 2.5\text{--}3.5\mu\text{m}$.

Habitat: On leaves of *Phaseolus vulgaris* (Leguminosae), Jurong, Singapore, leg. Shu-ling Lin, Dec. 10, 1968.

Distribution: N. & S. America, Africa, India, China, Manchuria. Japan and Singapore.

15. *Cercospora capsici* Heald & Wolf

Mycologia 3:15, 1911.

Leaf spots suborbicular, 1–5 up to 10mm in diam., at first brown, then becoming grayish brown, raised on the upper surface, surrounded by a raised dark brown border. Fruiting amphigenous, invisible. Stromata lacking or small, brown $15\text{--}30\mu\text{m}$ in diam. Fascicles poor to mildly dense (2–18 stalks), emerging through the stomata. Conidiophores straight to slightly curved, simple, 1–3 abruptly geniculate, 1–2 septate, medium brown, paler towards the apex, a dark brown conidial scar at the truncate tip, $30\text{--}60 \times 4.5\text{--}5.5\mu\text{m}$. Conidia hyaline, acicular, straight or slightly curved, 1–5 septate, tip subobtusate, base truncate, $30\text{--}125 \times 3.5\text{--}4\mu\text{m}$.

Habitat: On leaves of *Capsicum annum* (Solanaceae), Bukit Timah, Singapore, leg. G. Lim, Apr. 6, 1969.

Distribution: N. & S. America, China, Japan and Singapore.

16. *Cercospora cassiae-nodosae* Yen (Fig. 12)

Revue de Mycol. 43:97, 1979..

Leaf spots amphigenous, distinct, black, circular or subcircular, scattered, 1–2mm in diam., rarely 2–3 confluent. Fruiting strictly hypophyllous, visible as minute black pustules on the under surface of the spots. Stromata globose to irregularly globose, black brown, $25\text{--}40\mu\text{m}$ in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores hypophyllous, always simple, erect or slightly tortuous, olivaceous brown, 2–5 septate, 0–2 geniculate, a dark brown conidial scar at the rounded tip, $60\text{--}145 \times 3\text{--}4\mu\text{m}$. Conidia obclavate, olivaceous brown, curved, 3–7 (generally 5–6) septate, tip conic, base obconically subtruncate, with a dark brown scar at the end, $25\text{--}65 \times 3\text{--}5\mu\text{m}$.

Habitat: On leaves of *Cassia nodosa* (Leguminosae), Kuala Lumpur (For. Res. Inst.), Malaysia, leg. Jo-min Yen (No. 71339), Sept. 28, 1971.

Note: This fungus is distinct from others by its black leaf spots, developed stromata, coloured conidia and long conidiophores ($60\text{--}145\mu\text{m}$).

17. *Cercospora cassiae-occidentalis* Yen (Fig. 13)

Revue de Mycol. 29:212, 1964.

Leaf spots indistinct, sometimes with many small gray reddish points on both sides of the leaf. Fruiting amphigenous, invisible. Stromata lacking. Fascicles very poor (2–6 stalks), filling stomatal opening. Conidiophores simple, not branched, olivaceous brown, 2–6 septate, 1–5 geniculate, straight or tortuous, paler and more narrow towards the tip, bulbiform at the base, a brown small conidial scar at the attenuate tip, 60–128.5 x 4–5 μ m. Conidia pale olivaceous brown, obclavato-cylindrical or cylindrical for the short ones, straight or slightly curved, 3–6 septate, tip rounded or subrounded, base obconically truncate, 62.4–98.5 x 3.6–4.8 μ m.

Habitat: On leaves of *Cassia occidentalis* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 30) Apr. 25, 1964.

Note: The amphigenous fruiting and the unbranched conidiophores separate this species from *Pseudocercospora nigricans* (Cooke) Deighton.

18. *Cercospora citrullina* Cooke

Grevillea 12:31, 1883.

Syn.: *Cercospora cucurbitae* Ell. & Ev., J. Mycol. 4:3, 1888.

Cercospora sechii Stevenson, P. Rico Ins. Exp. Sta. Dept. Agr. Ann. Rept. (1917), 18:137, 1919.

Cercospora chardoniana Chupp, Monogr. Univ. R. Rico. B. 2:245, 1934.

Cercospora momordicae Mendoza, Philipp. J. Sci. 75:173, 1941.

Cercospora momordicae Sawada, Descr. Cat. Formosan Fungi. 9:173, 1943.

Leaf spots subcircular or angular to irregular, 2–5mm up to 10mm in diam., brownish with a dark brown to purplish raised border, centre becoming grayish. Fruiting amphigenous but chiefly epiphyllous, invisible. Stromata lacking or consisting of few brown cells. Fascicles poor to medium (2–10 stalks), emerging through the stomata. Conidiophores simple, erect or slightly flexuous, usually geniculate at the upper part, 2–8 septate, 1–6 geniculate, olivaceous brown, but paler towards the apex, a large black brown conidial scar at the rounded tip, 40–240 x 3.5–5 μ m. Conidia acicular or filiform, sometimes cylindrical, hyaline, straight or curved, 3–29 septate, tip acute, base truncate, 60–447 x 3–4 μ m.

Habitat: On leaves of *Momordica charantia* (Cucurbitaceae), Bukit Timah, Singapore, leg. G. Lim, Jul. 17, 1969.

Distribution: N. & S. America, Europe, Africa, China, Japan and Singapore.

19. *Cercospora coleiana* Yen & Lim (Fig. 14)

Bull. Soc. Mycol. 85:463, 1969.

Leaf spots amphigenous, circular to irregularly circular, brown to dark brown, but centre becoming whitish and with an indefinite border, 1–6mm in diam. Fruiting amphigenous, but more abundant on the lower side, invisible. Stromata lacking. Fascicles very poor (2–4 stalks), emerging through the stomata. Conidiophores pale brown to brown, simple or branched, erect or flexuous, 0–11 septate, 0–5 slightly geniculate, a small black brown conidial scar at the attenuate apex, usually several (5–10) black brown conidial scars on the upper part of the old ones, 40–181 x 5–7.2 μ m. Conidia acicular, hyaline, straight or slightly curved, 1–18 septate, tip acute, base truncate with a black brown scar at the end, (40–) 80–276 x 2–4.8 μ m.

Habitat: On leaves of *Coleus* sp. (Labiatae), Singapore, leg. G. Lim, Jul. 17, 1969.

Note: *Cercospora coleicola* Chupp & Mull and *C. colei* Boed. are different from this fungus by their conidiophores always simple, in dense to very dense fascicles and especially by their epiphyllous fruiting.

20. *Cercospora dioscorae-pyrifoliae* Yen (Fig. 15)

Bull. Soc. Mycol. Fr. 84:5, 1968.

Leaf spots amphigenous, more distinct on the upper side, circular, 0.5–8mm in diam., whitish in the centre, surrounded by a dark brown border, finally forming "shot-hole". Fruiting amphiphyllous, visible as short black hairs in the centre of spots. Stromata lacking or very rudimentary, consisting of few brown cells. Fascicles poor to dense (2–28 stalks), emerging through the stomata. Conidiophores dark brown, simple, erect or slightly flexuous, 1–7 septate, 0–3 geniculate, 1–2 small black brown conidial scars at the rounded tip, 36–200 x 6–8.4 μ m. Conidia acicular, hyaline, straight or curved, 3–18 septate, tip acute, base truncate, with a black brown scar at the end, 45.6–168 x 3.5–6 μ m.

Habitat: On leaves of *Dioscorea pyrifolia* (Dioscoreaceae), Jurong, Singapore, leg. Jo-min Yen (No. M.S. 738), Dec. 17, 1965.

Note: This fungus differs from others (*Cercospora ubi* Rac. and *Pseudocercospora ubicola* (Yen) Deighton) by the "shot-hole" leaf spots and the acicular and hyaline conidia.

21. *Cercospora eupatorii-odorati* Yen (Fig. 16, D-J)

Bull. Soc. Mycol. Fr. 84:10, 1968.

Leaf spots amphigenous, circular, more distinct on the upper side, brown to dark brown, scattered, 2–6mm in diam., sometimes coalescing and forming large patches. Fruiting strictly hypophyllous, invisible. Stromata absent or small, dark brown, globose, 18–42 μ m in diam. Fascicles poor to meagre (2–9 stalks), sometimes dense, emerging through the stomata. External hyphae hypophyllous, also emerging through the stomata, pale olivaceous brown, septate, branched, 2.5–5 μ m in width. Both the conidiophores from fascicles and arising from external hyphae may be brown or olivaceous brown, straight or flexuous, simple or branched, 0–10 septate, 0–2 geniculate, 1–2 small black brown conidial scars at the shortly attenuate tip, 38.4–168 x 4.5–6 μ m. Conidia cylindrical, pale olivaceous brown, catenate or slightly curved, 1–4 (generally 3) septate, small black brown conidial scars at both rounded ends, 22.8–57.6 x 3.6–5 μ m.

Habitat: On leaves of *Eupatorium odoratum* (Compositae), Ipoh, Malaysia, leg. Jo-min Yen (No. M.S. 728), Dec. 21, 1965.

22. *Cercospora gloriosicola* Yen & Lim (Fig. 17)

Bull. Soc. Mycol. Fr. 85:467, 1969.

Leaf spots distinct, oval or oblong, brown with an indefinite border, scattered 3–14 x 2–7mm. Fruiting amphigenous, appearing as minute black pustules. Stromata very developed, black brown, globose, 48–70 μ m in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores pale brown, simple or branched, tortuous, 3–6 geniculate, 4–6 septate, a large black brown conidial scar at the rounded tip and several (3–5) black brown scars laterally displaced on the upper part, 80–168 x 4.8–7.2 μ m. Conidia hyaline, obclavato-cylindrical, straight or slightly curved, 3–11 septate, apex rounded or subobtuse, base truncate with a black brown scar at the end, 50–120 x 4–5 μ m.

Habitat: On leaves of *Gloriosa superba* (Liliaceae), Bukit Timah, Singapore, leg. G. Lim, Aug. 2, 1969.

23. *Cercospora henningsii* Allesch.

Engler's Pfl. Ost-Afr. Teil C, p. 35, 1895.

Syn. *Cercospora cassavae* Ell. & Ev., Bull. Torrey Bot. Club, 22:438, 1895.

Cercospora manihotis P. Henn. Hedwigia 41:18, 1902.

Cercospora cearae Petch, Ann. Roy. Bot. Gard. Paradisiya 3:10, 1906.

Septogloeum manihotis Zimm., Centralbl. f. Bakt. Abt. 2, 8:218, 1902.

Helminthosporium manihotis Rangel, Arch. Jard. Bot. Rio de Janeiro 2:71, 1917.

Leaf spots circular to subcircular, more distinct on the upper side of the leaf, scattered, 3–12mm in diam. pale brown or tan dingy to dingy gray with a yellowish brown margin, rather indefinite on the lower surface. Fruiting amphigenous, visible as minute black pustules under the hand lens. Stromata small, dark brown, globose, 20–40 μ m in diam. Fascicles dense to very dense, filling the stomatal opening. Conidiophores pale olivaceous brown, uniform in colour and width, simple, straight or slightly flexuous, 0–2 midly geniculate, at times sparingly septate, tip rounded with a small brown conidial scar, 10–50 x 3.5–5 μ m, rarely as long as 100 μ m. Conidia cylindrical, pale olivaceous brown, straight or slightly curved, 2–8 septate, both ends bluntly rounded or base shortly obconically truncate, 30–60 x 4–6 μ m (rarely as large as 85 x 7 μ m).

Habitat: On leaves of *Manihot utilissima* (Euphorbiaceae), Bukit Timah, Singapore, leg. G. Lim, Mar. 13, 1969.

Distribution: N. America, E. Africa, Barbados, Belgian Congo, Brazil, Ceylon Colombia, Costa Rica, Gold Coast, Panama, Philippines, Puerto Rico, San Domingo, Sierra Leone, Singapore, Taiwan, Tanganyika, Trinidad and Uganda.

24. *Cercospora holobrunnea* Yen (Fig. 18)

Revue de Mycol. 31:112 1966.

Leaf spots indistinct, yellowish brown. Fruiting amphigenous, but mostly hypophyllous. Stromata lacking. Fascicles lacking. External hyphae amphigenous, but mostly hypophyllous, olivaceous brown, emerging through the stomata, septate, branched, 2–3 μ m in width. Conidiophores as single branches from external procumbent threads, olivaceous brown, cylindrical, 1–2 septate, 0–1 geniculate, a small brown conidial scar at the rounded tip, 24–36 x 2.4–3.6 μ m. Conidia cylindrical, pale olivaceous brown, straight or slightly curved, 2–5 septate, tip rounded, base truncate with a dark brown conidial scar at the end, 24–74.4 x 2.4–3 μ m.

Habitat: On leaves of *Hydrangea macrophylla* (Hydrangeaceae), Bukit Timah, Singapore, leg. Mrs. Shu-hsien Yen (No. 89), Dec. 4, 1964; on the same host-plant, in Hwa Chung College, Singapore, leg. Chih-shao Lee & Mrs. Shu-hsien Pen (No. 109), April 1965.

25. *Cercospora hyalofilispora* Yen (Fig. 19)

Revue de Mycol. 31:115, 1966.

Leaf spots none or indistinct. Fruiting hypophyllous, invisible. Stromata lacking. Fascicles lacking. External hyphae hypophyllous, hyaline, emerging through the stomata, septate, branched, very thin, 1–1.5 μ m in width. Conidiophores arising as single branches from external threads, pale olivaceous brown, 0–1 septate, not geniculate, with zigzag membrane, a small brown conidial scar at the attenuate tip, 16.8–28.8 x 3–3.6 μ m; at times some conidiophores emerging through the stomata, 30–50 x 3.6–4 μ m. Conidia filiform, hyaline, very thin, slightly curved, 3–14 septate, tip acute, base truncate with a dark brown scar at the end, 28–123 x 1–1.5 μ m.

Habitat: On leaves of *Hydrangea macrophylla* (Hydrangeaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 95), Dec. 18, 1964.

26. *Cercospora hydrangeae* Ell. & Ev.

J. Mycol. 8:71, 1902.

Syn. *Cercospora hydrangeicola* Speg., Ann. Nac. Buenos Aires 20:426, 1910.

Cercospora hydrangicola Tharp, Mycologia 9:110, 1917.

Cercospora arboressentis Teh. & Dan., Mycologia 17:246, 1925.

Leaf spots subcircular, pale, brown with a black brown border, scattered, 3–7mm in diam., sometimes confluent. Fruiting amphigenous, but mostly epiphyllous. Stromata poor or small, brown, globose, 20–36 μ m in diam. Fascicles poor to dense (2–20 stalks), emerging through the stomata. Conidiophores amphigenous, erect or flexuous, medium brown, not branched, 1–5 (rarely 8 or 9) septate, 1–5 geniculate, a large brown conidial scar at the rounded tip, 48–160 x 4.5–7 μ m. Conidia acicular or obclavato-acicular, hyaline straight or curved, 5–11 septate, tip subacute, base truncate with a terminal dark scar, 184–176 x 3.6–4.8 μ m.

Habitat: On leaves of *Hydrangea macrophylla* (Hydrangeaceae), Bukit Timah, Singapore, leg. Mrs. Shu-hsien Yen (No. 89), Dec. 4, 1964; on the same host-plant, in Hwa Chung College, Singapore, leg. Chih-shao Lee & Mrs. Shu-hsien Yen (No. 96), Dec. 31, 1964.

Distribution: N. America, Argentine, Japan, Singapore and Taiwan.

27. *Cercospora ipomoeae-pes-caprae* Yen & Lim (Fig. 20)

Bull. Soc. Mycol. Fr. 86:747, 1970b.

Leaf spots amphigenous, distinct, circular to irregular circular, pale brown to brown, paler in the centre, with a thicker black brown border, scattered, 1–4mm in diam., sometimes confluent. Fruiting amphiphylous, visible as black minute pustules under the hand lens. Stromata substomatic, composed of finely granulate membrane cells, black brown, globose, 19–38 μ m in diam. Fascicles poor to meagre (2–8 stalks), emerging through the stomata. Conidiophores olivaceous brown, cylindrical, erect, simple, continuous or 1-septate, not geniculate, a large black brown conidial scar at the rounded tip, 30–40 x 4–5 μ m. Conidia obclavate, hyaline, straight or slightly curved, 3–14-septate, apex obtuse, base truncate with a black brown scar at the end, 44–115 x 3–4.5 μ m.

Habitat: On leaves of *Ipomoea pes-caprae* (Convolvulaceae), Pulau Besar island, Malaysia, leg. G. Lim, Jan. 10, 1970.

28. *Cercospora mikaniicola* Stev.

Trans. III. Acad. Sci. 10:213, 1917.

Syn. *Cercospora mikaniae-cordiae* Yen, Revue de Mycol. 30:183, 1965.

Leaf spots amphigenous circular, at first very small, 0.5–1mm in diam., reddish brown with a whitish centre, then becoming larger, 3–5mm in diam., forming "Frog eyes" and surrounded by a brown border. Fruiting amphiphylous, but chiefly hypophyllous. Stromata lacking or very rudimentary. Fascicles very poor (2–7 stalks), emerging through the stomata. Conidiophores simple, never branched, erect, cylindrical, brown, paler toward the apex, 1–2-septate, 0–2 geniculate, a large black brown conidial scar at the rounded tip, some scars laterally displaced, 52–102 x 5–7.2 μ m. Conidia hyaline, abruptly obclavate, at times somewhat fusiform, straight or curved, 3–9-septate, with a long whip-like tip, base attenuate and truncate, with a black scar at the end, 89–138 x 7.2–12 μ m.

Habitat: On leaves of *Mikania cordata* (Compositae), Bukit Timah, Singapore, leg. Mrs. Shu-hsien Yen (No. 68), Jul. 1, 1964.

Distribution: Puerto Rico and Singapore.

29. *Cercospora malayensis* Stev. & Solh.

Mycologia 23:394, 1931.

Leaf spots circular to irregular, tan to brown, usually with a purple or red border, fairly broad, 5–25mm in length, frequently extending from the edge of the leaf to the midrib. Fruiting amphigenous, invisible. Stromata lacking or rudimentary. Fascicles meagre to dense (5–20 stalks), emerging through the

stomata or rupture of the epidermis. Conidiophores pale brown, simple, straight or flexuous, apex rounded, $35\text{--}250 \times 3\text{--}4\mu\text{m}$. Conidia subhyaline, acicular to obclavato-acicular, multi-septate, tip acute, base truncate, $70\text{--}115 \times 2.5\text{--}3\mu\text{m}$.

Habitat: On leaves of *Hibiscus mutabilis* (Malvaceae), Singapore, leg. G. Lim (No. S.U. 48), Apr. 1970.

Distribution: N. & S. America, S. Africa, Brazil, Jamaica, Japan, Philippines, Salvador, Singapore, Taiwan, Trinidad and Venezuela.

30. *Cercospora nicotianae* Ell. & Ev.

Proc. Acad. Sci. Phila. 45:170, 1893.

Syn. *Cercospora raciborskii* Sacc. & Syd., Syll. Fung. 16:1070, 1902.

Leaf spots amphigenous, circular to subcircular, larger ones concentrically zonate, uniformly brown to dark brown, 1–15mm in diam., sometimes confluent. Fruiting amphiphylous, invisible. Fascicles poor (2–7 stalks), emerging through the stomata. Stromata very rudimentary, consisting of a few brown cells. Conidiophores brown to dark brown, simple, sometimes branched, erect or flexuous, 0–4 geniculate, 2–8 septate, a large conidial scar at the rounded tip, $38\text{--}180 \times 3.6\text{--}6\mu\text{m}$. Conidia acicular, hyaline, slightly curved, 3–15 septate, tip subacute, with a black brown scar at the end, $45\text{--}165 \times 3\text{--}4\mu\text{m}$.

Habitat: On leaves of *Nicotiana tabacum* (Solanaceae), Jurong, Singapore, leg. Jo-min Yen (No. M.S. 723), Dec. 15, 1965.

Distribution: Africa, S. America, Europe, Japan, Peru, Singapore and Taiwan.

31. *Cercospora nicotianicola* Yen (Fig. 21)

Revue de Mycol. 32:188, 1967a.

Leaf spots amphigenous, distinct, triangular or irregularly angular, vein-limited, white and surrounded by a raised dark brown border, scattered, 1–3mm in diam. Fruiting amphiphylous, visible as black powder at the white centre of leaf spots. Stromata small, dark brown, subglobose, $24\text{--}54\mu\text{m}$ in diam. Fascicles poor to dense (2–18 stalks), emerging through the stomata. Conidiophores brown to dark brown, paler toward the tip, generally simple, at times branched, 2–4(–5) septate, 0–2 geniculate, one or several small conidial scars at the attenuate tip, 5–15 small brown scars laterally displaced on the upper part, then appearing as denticulate form, $60\text{--}218 \times 5\text{--}6\mu\text{m}$. Conidia hyaline, filiform or acicular, straight or slightly curved, 2–48 septate, tip rounded or obtuse, base truncate and with a black scar at the end, $70\text{--}480 \times 2.5\text{--}3.6\mu\text{m}$.

Habitat: On leaves of *Nicotiana tabacum* (Solanaceae), Jurong, Singapore, leg. Jo-min Yen (No. M.S. 724), Dec. 18, 1965.

Note: The small, white leaf spots, the attenuate apex conidiophores and the filiform conidia separate this species from *Cercospora nicotianae* Ell. & Ev.

32. *Cercospora peristrophes-acuminatae* Yen (Fig. 22)

Revue de Mycol. 29:230, 1964.

Leaf spots none or indistinct, sometimes as dark, brown areas but not distinct. Fruiting hypophyllous, rarely amphiphyllous. Stromata lacking. Fascicles poor to meagre (2–8 stalks), filling stomatal opening. Conidiophores hypophyllous, rarely amphigenous, simple, erect, brown to dark brown, paler and more narrow towards the tip, a small, black brown conidial scar at the tip and several small, black-brown scars laterally displaced at the upper part, 3–12 septate, not geniculate, $156\text{--}295 \times 6\text{--}7.2\mu\text{m}$. Conidia clavate or long-oblong, pale olivaceous brown, 1–3 septate, straight, tip rounded, base attenuate and truncate, $32\text{--}45 \times 8\text{--}8.5\mu\text{m}$.

Habitat: On leaves of *Peristrophe acuminata* (Acanthaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 20), Apr. 20, 1964.

33. *Cercospora psophocarpicola* Yen (Fig. 23)

Bull. Soc. Mycol. Fr. 83:339, 1967b.

Leaf spots circular or irregular, brown with an indefinite border, scattered, 1–4mm in diam., frequently confluent. Fruiting hypogenous, usually mixed with that of *Pseudocercospora psophocarpi* (Yen) Deighton. Stromata lacking or very rudimentary, black brown, irregularly globose, $15\text{--}20\mu\text{m}$ in diam. Fascicles poor to meagre (2–7 stalks), emerging through the stomata. Conidiophores strictly hypophyllous, dark brown, simple, never branched, erect or slightly flexuous, 1–4 septate, 1–4 geniculate, a large, black brown conidial scar at the rounded tip, $22.8\text{--}260 \times 4.8\text{--}6\mu\text{m}$. Conidia acicular, sometimes filiform, hyaline, straight or slightly curved, 4–17 septate, apex acute, base truncate with a black brown scar at the end, $54\text{--}234 \times 2.4\text{--}3.6\mu\text{m}$.

Habitat: On leaves of *Psophocarpus tetragonolobus* (Leguminosae), Jurong, Singapore, leg. Jo-min Yen (No. M.S. 717bis), Dec. 31, 1965.

34. *Cercospora pudicae* Yen (Fig. 24)

Revue de Mycol. 29:234, 1964.

Leaf spots none or indistinct. Fruiting amphiphyllous, effuse, whitish on both surfaces of the leaf. Stromata lacking. Fascicles rather dense or meagre, emerging through the stomata. Conidiophores pale olivaceous brown, simple, sometimes branched, erect or tortuous, 0–1 septate, 0–1 geniculate, medium brown conidial scar at the rounded apex, $20.4\text{--}36 \times 4.8\text{--}6\mu\text{m}$. Conidia hyaline or subhyaline, long fusiform, 1–4 septate, straight or slightly curved, tip rounded or subconic, base attenuate, $31.2\text{--}46 \times 3\text{--}4.5\mu\text{m}$.

Habitat: On leaves of *Mimosa pudica* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 42), Mar. 15, 1964.

Distribution: Burma, Cuba, India, Jamaica, Mauritius, Puerto Rico, Singapore and Venezuela.

35. *Cercospora sesamigena* Yen & Lim (Fig. 25)

Cahiers du Pacifique 17:103, 1973.

Leaf spots amphigenous, brown, irregularly angular, scattered, 0.3–4mm in diam., sometimes confluent on the edges of leaf. Fruiting amphiphylous, invisible. Stromata absent or very rudimentary. Fascicles usually poor to meagre (2–8 stalks), emerging through the stomata. Conidiophores pale brown, simple or rarely branched, erect or flexuous, 0–8 septate, 0–3 geniculate, a large black brown conidial scar at the rounded tip, several small brown scars laterally displaced at the upper part, 25–185 x 4–5.5 μ m. Conidia acicular, hyaline, straight or slightly curved, 3–32 septate, tip acute, base truncate with a black brown scar at the end, 75–490 x 3–4 μ m.

Habitat: On leaves of *Sesamum orientalis* (Pedaliaceae), Singapore, leg. G. Lim (No. S.U. 74), Feb. 12, 1972.

36. *Cercospora thunbergiana* Yen (Fig. 26)

Revue de Mycol. 30:198, 1965.

Leaf spots amphigenous, circular, brown with a dark brown border scattered, 2–7mm in diam., finally forming "shot-holes". Fruiting amphigenous, invisible. Stromata lacking or very rudimentary, consisting of few brown cells. Fascicles poor (2–7 stalks), emerging through the stomata. Conidiophores either coming from fascicles or arising from the external hyphae, always simple, erect or slightly tortuous, 2–9 septate, 0–2 geniculate, dark brown, paler towards the apex, a large, black brown conidial scar at the truncate tip, 70–228 x 6–8.5 μ m. Conidia acicular, hyaline, straight or slightly curved, 7–34 septate, tip acute, base truncate with a black brown scar at the end, 95–360 x 5–7 μ m.

Habitat: On leaves of *Thunbergia alata* (Acanthaceae), Bukit Timah (Hwa Chung College), Singapore, leg. Mrs. Shu-hsien Yen (No. 74), Aug. 3, 1964.

Note: This fungus differs from others (*Cercospora thunbergiae* Boed. and *Pseudocercospora thunbergiicola* (Yen) Deighton by its amphigenous fruiting and specially by its hyaline, acicular conidia.

37. *Cercospora tithoniae* Baker & Dale

Mycol. Papers 33:106, 1951.

Syn. *Cercospora tithoniae* Chidd., Mycopath. appl. Myc. 17:79, 1962.

Cercospora tithoncola (Chidd.) Yen, Revue de Mycol. 31:144, 1966.

Leaf spots distinct, brownish, angular or irregular, vein-limited, small, scattered, 0.3–2mm in diam., at last coalescing and covering the whole surface of the leaf. Fruiting amphigenous, invisible. Stromata brownish, globose or irregularly globose, 16–50 μ m in diam. Fascicles meagre to very dense (4–35 stalks), emerging through the stomata. Conidiophores amphiphylous, pale olivaceous brown, unicolour simple, erect or slightly tortuous, 0–3 septate, 0–1 geniculate, a large, black brown conidial scar at the rounded tip, 74–112 x 4–5 μ m. Conidia obclavato-cylindrical, pale olivaceous brown, straight or mildly curved, 1–6 septate, tip rounded, catenulate, then each end of the conidia holding a conidial scar, base slightly attenuate and truncate with a black brown scar at the end, 33.6–85 x 3.6–5 μ m.

Habitat: On leaves of *Tithonia diversifolia* (Compositae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 113), Apr. 13, 1965.

Distribution: India and Singapore.

38. *Cercospora triseptospora* Yen (Fig. 27)

Revue de Mycol. 31:146, 1966.

Leaf spots none or indistinct, appearing as brownish areas. Fruiting hypogeous, rarely amphiphylous, invisible. Stromata lacking or very small, black brown, globose, 16–24 μ m in diam. Fascicles poor to medium (2–11 stalks), emerging through the stomata. External hyphae hypogeous, emerging through the stomata, pale olivaceous brown, septate, branched, 1.5–2.5 μ m in width. Conidiophores either coming from fascicles or arising from external hyphae, always simple, pale brown, straight, cylindrical, 1–3 septate, 0.2 μ m geniculate, several black brown conidial scars displaced on the upper part, then the membrane becoming denticulate, 25.5–70 x 3–4.5 μ m. Conidia cylindrical or obclavate-cylindrical, pale olivaceous brown, straight or slightly curved, with a finely granulate membrane, 3 septate, tip rounded, base slightly attenuate and subtruncate, 24–66 x 2.4–3 μ m.

Habitat: On leaves of *Hydrangea macrophylla* (Hydrangeaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 95), Dec. 18, 1964.

39. *Cercospora volkameriae* Speg.

Revista del Museo de la Plata 15:47, 1908.

Leaf spots amphigenous, angular, strictly vein-limited, reddish brown to gray brown, scattered, 0.5–12mm in diam., more distinct on the upper side. Stromata lacking or very rudimentary. Fruiting amphiphylous, invisible. Fascicles poor to medium (3–12 stalks), emerging through the stomata. Conidiophores always simple, erect or flexuous, pale brown to olivaceous brown, 1–11 septate, 0–5 geniculate, a large black brown scar at the rounded tip, 40–261 x 4–7.2 μ m. Conidia acicular, hyaline, straight or slightly curved, 3–30 septate, apex acute, base truncate with a black brown scar at the end, 82–278 x 3.6–7.2 μ m.

Habitat: On leaves of *Clerodendron fragrans* (Verbenaceae), Changi, Singapore, leg. Mrs. Shu-hsien Yen (No. 146), Dec. 31, 1966.

Distribution: Brazil and Singapore.

40. *Cercospora zinniae* Ell. & Mart.

J. Mycol. 1:20, 1885.

Syn. *Cercospora atricinctata* Head & Wolf, Mycologia. 3:14, 1911.

Cercospora zinniae Takah. & Yosh., Plant Protect (Shoku-butsu-boeki) 7:17, 1953.

Leaf spots circular to angular or irregularly angular, more or less vein-limited, at first brown, later becoming gray or white, with a dark brown or purplish black margin, scattered, 2–14mm in diam., but often coalescing and forming large patches. Fruiting amphigenous, but mostly epiphyllous, visible as minute black hairs under the hand lens. Stromata black brown, globose or subglobose, 20–42 μ m. Fascicles poor to dense (2–20 stalks), emerging through the stomata. Conidio-

phores pale brown to brown, simple, never branched, straight or tortuous, 0–10 septate, 1–4 geniculate, a large black brown conidial scar at the rounded tip (sometimes tip shouldered), 48–300 x 4.8–7.2 μm . Conidia acicular or filiform, hyaline, very long, curved or slightly undulate, 14–25 septate, tip obtuse, base truncate with a terminal black brown scar, 150–328 x 3–33.6 μm .

Habitat: On leaves of *Zinnia elegans* (Convolvulaceae), Bukit Timah, Singapore, leg. Lee Chih-shao (No. 14), Aug. 20, 1965.

Distribution: N. & S. America, Japan, Guam, Colombia, Guatemala, Puerto Rico, San Domingo, Salvador, Singapore, Taiwan, Trinidad, Uganda and Venezuela.

41. *Cercosporidium personatum* (Berk. & Curt.) Deighton Mycol. Papers 112:71, 1967.

= *Cladosporium personatum* Berk. & Curt., Grevillea 3:106, 1875.

Cercospora personata (Berk. & Curt.) Ell. & Ev., J. Mycol. 1:63, 1885.

Passalora personata (Berk. & Curt.) Shakil A. Khan & Mamal, Pakistan J. Sci. Res. 13(4):188, 1961.

Septogloeum arachidis Racib. Z. Pflanzenkr. 8:66, 1898.

Cercospora arachidis P. Henn., Hedwigia 41:18, 1902.

Perfect state: *Mycosphaerella berkeleyi* W.A. Jenkins, J. agric. Res. 56:330, 1938.

Leaf spots orbicular, dark brown, scattered, 0.5–3 mm in diam. Fruiting hypophyllous (never epiphyllous), visible as black pustules under hand lens. Fascicles always very dense. Stromata well developed, pale brown, subglobose, 35–70 μm in diam., but sometimes extending to 150 μm long. Conidiophores strictly hypogenous, emerging through the stomata, olivaceous brown, simple, erect or tortuous, continuous or 1 septate, with 0–3 small geniculations, a large black brown conidial scar at the rounded tip, 35–65 x 5–7 μm . Conidia fusiform or obclavato-cylindrical, at times obclavate, straight or very slightly curved, 3–7 septate, tip rounded, base rounded or slightly subtruncate, with a large black brown scar at the end, 42–73 x 6–8 μm .

Habitat: On leaves of *Arachis hypogaea* (Leguminosae), Kuala Lumpur, Malaysia, leg. Jo-min Yen (No. 71139bis), Sept. 28, 1971.

Distribution: N. America, Argentina, Australia, Brazil, China (Kwangtung), Congo, Hong-Kong, India, Jamaica, Malaysia, Nepal, New Guinea, Nigeria, W. Pakistan, Paraguay, Philippines, Sarawak, Sierra Leone, Singapore, Trinidad and Turkey.

Note: According to Chupp (1954), *Cercospora arachidicola* Hori and *Cercospora personata* (Berk. & Curt.) Ell. & Ev. (= *Cercosporidium personatum* (Berk. & Curt.) Deighton) always have amphiphyllous fruiting. But this material always presents hypogenous fruiting.

42. *Pseudocercospora abacopteridicola* (Yen & Lim) Yen, comb. nov. (Fig. 7, A B).

= *Cercospora abacopteridicola* Yen & Lim, Cahiers du Pacifique 17:97, 1973.

Leaf spots amphigenous, brown, with an indefinite border, at first vein-limited, later confluent. Fruiting hypogenous, invisible. Stromata lacking. Fascicles absent. External hyphae hypophyllous, emerging through the stomata, pale olivaceous brown, septate, branched, 1.5–2.5 μ m in width. Conidiophores hypophyllous, simple, erect, 0–1 septate, not geniculate, tip rounded or slightly attenuate, conidial scars inconspicuous, 6–16 x 2.5–3 μ m. Conidia pale olivaceous brown, cylindrical or obclavato-cylindrical, slightly curved, 1–7(–9) septate, tip rounded, base truncate, 32–80 x 2–3 μ m.

Habitat: On leaves of *Abacopteris urophylla* (Pteridophyte), Singapore, leg. G. Lim (No. 71bis), Mar. 3, 1972.

43. *Pseudocercospora abelmoschi* (Ell. & Ev.) Deighton Mycol. Papers 140:139, 1976.

= *Cercospora abelmoschi* Ell. & Ev., J. Inst. Jamaica 1:347, 1893.

Syn. *Cercospora hibisci-manihotis* P. Henn., Hedwigia 43:146, 1904.

Cercospora hibisci-cannabini Sawada, Descr. Cat. Formosan Fungi 2:153, 1922.

Leaf spots indistinct or small, angular, dark gray, more distinct on lower side of the leaf, vein-limited, sometimes extending over the entire leaf surface. Fruiting amphigenous, invisible. Stromata lacking or small, brown, globose, 21–32 μ m in diam. Fascicles poor to medium (2–15 stalks), emerging through the stomata. Conidiophores olivaceous brown, simple or branched, erect or slightly flexuous, not geniculate, 0–3(–4) septate, tip rounded or attenuate and truncate, 32–100 x 4.8–6 μ m. Conidia pale olivaceous brown, attenuate on both ends, then appearing as long fusiform, usually curved, crescent, 1–7 septate (generally 3–5), tip obtuse, base attenuate and truncate, 36–100 x 4.5–6 μ m.

Habitat: On leaves of *Hibiscus esculentus* (Malvaceae), Bukit Timah, Singapore, leg. Koh Choy-kuan, May 25, 1969.

Distribution: N.C. & S. America, Australia, Japan, Singapore and Taiwan.

44. *Pseudocercospora acalyphigena* (Yen) Yen, comb. nov. (Fig. 28)

= *Cercospora acalyphicola* Yen, Revue de Mycol. 31:109, 1966.

Leaf indistinct, at first irregularly subcircular, yellowish with indefinite border, then confluent, yellowish brown or brownish gray. Fruiting amphigenous, invisible. Stromata lacking or consisting of a few olivaceous brown cells. Fascicles poor to medium (2–12 stalks). Conidiophores amphiphyllous, emerging through the stomata, pale olivaceous brown, erect or slightly flexuous, generally simple, sometimes branched, 0–3 septate, 0–1 geniculate, constricted at the septa, tip attenuate and truncate, the base cells much larger (8.5–9.6 μ m in diam.), 18–50 x 3.6–5 μ m. Conidia cylindrical or obclavato-cylindrical pale olivaceous brown, straight, sometimes slightly curved, 3–10 septate, tip conic, base attenuate and truncate, 34–135 x 2.5–4.8 μ m.

Habitat: On leaves of *Acalypha indica* (Euphorbiaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 40), May 16, 1964.

Note: *Pseudocercospora acalyphicola* (Petr.) Deighton differs from this fungus by its shorter and hyaline conidia.

45. *Pseudocercospora allamendae* (Yen) Yen, comb. nov. (Fig. 29. A-F)

= *Cercospora allamendae* Yen, Revue de Mycol. 30:166, 1965.

Leaf spots none or indistinct, sometimes appearing as indistinct gray black areas. Fruiting hypophyllous, invisible. Stromata lacking. External hyphae emerging through the stomata, hypogenous, pale olivaceous brown, septate, branched, 2–2.5 μ m in width. Conidiophores hypogenous, in fascicles poor to meagre (2–8 stalks), may be classified into two kinds: A, conidiophores coming from fascicles, emerging through the stomatal opening, olivaceous brown, paler and more narrow towards the tip, simple or branched, erect or tortuous, 0–2 geniculate, 1–4 septate, 21.6–40 x 3.5–4.8 μ m, conidial scars inconspicuous; B, conidiophores as single branches from procumbent threads, simple, olivaceous brown, 0–1 geniculate, 0–2 septate, tip rounded or slightly attenuate, conidial scars indistinct, 9.6–22 x 3–3.6 μ m. Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, 2–5 septate, tip conic rounded, base subtruncate, 31.2–54 x 2.4–3.6 μ m.

Habitat: On leaves of *Allamanda cathartica* (Apocynaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen, (No. 22), Apr. 25, 1964.

Note: *Pseudocercospora byliana* (Syd.) Yen is different from this fungus by its very developed stromata and its very dense fascicles.

46. *Pseudocercospora aranetae* (Borl. & Rold.) Yen, comb. nov. (Fig. 30)

= *Cercospora aranetae* Borl. & Rold., Araneta J. Agr. 11:181, 1964.

Leaf sports amphigenous, distinct, angular to irregular, small, with an indefinite border, more or less vein-limited, scattered, 1–4 mm in diam., sometimes confluent and forming large patches. Fruiting amphiphyllous, but more abundant on the lower side, appearing as gray or dark gray velvet on the lower surface of the spots. Stromata absent or small, brown, subglobose, 20–30 μ m in diam. Fascicles poor to dense (4–26 stalks), emerging through the stomata. Conidiophores amphigenous, chiefly hypophyllous, olivaceous brown, erect or flexuous, simple or branched, 1–4 septate, with 0–1 geniculate, tip attenuate, 39.6–68.4 x 4–6 μ m. Conidia obclavate, pale olivaceous brown, straight or slightly curved, 3–6 septate, tip obtuse, base attenuate and truncate, 42–62.4 x 3.6–4.8 μ m.

Habitat: On leaves of *Psophocarpus tetragonolobus* (Leguminosae), Jurong, Singapore, leg. Jo-min Yen (No. M.S. 717), Dec. 31, 1965.

Distribution: Philippines and Singapore.

47. *Pseudocercospora asystasiae* (Yen) Yen, comb. nov. (Fig. 31)

= *Cercospora asystasiae* Yen, Revue de Mycol. 32:178, 1967a.

Leaf spots distinct, circular, but more clear on the upper surface, yellowish brown or brown, with a black brown border, scattered, 3–10mm in diam., sometimes confluent. Fruiting amphigenous, invisible. Stromata lacking or very small, dark brown, globose, 14–30 μ m in diam. Fascicles poor to dense (3–16 stlks), emerging through the stomata. Conidiophores amphiphylous, straight or slightly flexuous, simple or branched, olivaceous brown, unicolour, 0–1 geniculate, 0–5 septate, tip rounded or truncate, conidial scars inconspicuous, 24–126 x 3.6–5 μ m. Conidia obclavate, but cylindrical for the short ones, pale olivaceous brown, straight or mildly curved, 3–8 septate, tip obtuse or subrounded, base slightly attenuate and truncate, 37.2–110 x 3.6–5 μ m.

Habitat: On leaves of *Asystasia coromandeliana* (Acanthaceae), Botanic Gardens, Singapore, leg. Jo-min Yen (No. M.S. 731), Jan. 5, 1966.

48. *Pseudocercospora bauhiniae* (H. & P. Syd.) Deighton Mycol. Papers 140:140, 1976.

= *Cercospora bauhiniae* H. & P. Syd. Ann. Mycol. 12:202, 1914.

Leaf spots circular to angular, 2–9mm in diam., grayish brown to pale brown, with a dark brown line margin. Fruiting chiefly hypophyllous. Stromata dark brown, globose to subglobose, 15–40 μ m in diam. Fascicles dense to very dense. Conidiophores pale brown to medium brown, paler and more narrow towards the tip, simple, 0–1 septate, straight to mildly curved, not geniculate, unthickened small conidial scar at the bluntly rounded tip, 10–20 x 3–4.5 μ m, sometimes as long as 40 μ m. Conidia subhyaline to pale olivaceous brown, obclavate, short ones may be cylindrical, almost straight, 3–9 septate, tip subobtuse, base obconically truncate, 30–125 x 2.5–5 μ m.

Habitat: On leaves of *Bauhinia malabarica* (Leguminosae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 114), May 13, 1965.

Distribution: Colombia, Ethiopia, Gold Coast, Singapore, Philippines, Transvaal and Venezuela.

49. *Pseudocercospora byliana* (Syd.) Yen, comb. nov.

= *Cercospora byliana* Syd., Ann. Mycol. 22:433, 1924.

Leaf spots angular to irregular, gray to reddish tinge with narrow reddish brown line border, 2–8mm in diam. Fruiting amphigenous, more abundant on the upper side, appearing as minute black pustules in the centre part of the spots. Stromata globular to irregular, 50–85 μ m in length, pale brown. Fascicles dense to very dense. Conidiophores pale olivaceous brown, paler towards the tip, simple, never branched, 0–1 septate, not geniculate, 8–24 x 3–4 μ m. Conidia obclavate, pale olivaceous brown, straight or slightly curved, multiseptate, tip subobtuse, base obconically truncate, 40–12 x 3.5–5 μ m.

Habitat: On leaves of *Allamanda cathartica* (Apocynaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 45), May 19, 1964.

Distribution: Singapore, Transvaal and Tzaneen.

50. *Pseudocercospora cassiae-alatae* (Yen & Lim) Yen, comb. nov. (Fig. 32, D et E)

= *Cercospora cassiae-alatae* Yen & Lim, Cahiers du Pacifique 17:99, 1973.

Leaf spots amphigenous, irregularly circular, black brown with an indefinite border, scattered, 1–5mm in diam. Fruiting amphiphylous, invisible. Stromata lacking. Fascicles absent. External hyphae amphigenous, emerging through the stomata, septate, branched, pale olivaceous brown, 1.5–2.5 μ m in width. Conidiophores arising from the external hyphae, pale olivaceous brown, simple, erect or slightly curved, 0–6 septate, 0–2 geniculate, apex irregularly rounded or truncate, conidial scars inconspicuous, 3–45 x 2.5–3.5 μ m. Conidia cylindrical, very thin, pale olivaceous brown, usually curved, 1–10 septate, tip rounded or obtuse, base slightly attenuate and truncate, 15–90 x 1.5–2 μ m.

Habitat: On leaves of *Cassia alata* (Leguminosae), Singapore, leg. G. Lim (No. S.U. 66), Jan. 5, 1971.

Note: This fungus differs from others by only the presence of external hyphae and solitary conidiophores.

51. *Pseudocercospora cassiigena* (Yen & Lim) Yen, comb. nov. (Fig. 32, A-C).

= *Cercospora cassiigena* Yen & Lim, Cahiers du Pacifique 17:98, 1973.

Leaf spots angular to irregular, brown, more or less vein-limited, scattered 1–4mm in diam., sometimes confluent. Fruiting amphiphylous, invisible. Stromata pale brown to brown, globose, 25–40 μ m in diam. Fascicles dense to very dense, emerging through the rupture of epidermis. Conidiophores pale brown, always simple, erect, continuous, not geniculate, apex rounded or slightly attenuate and truncate, conidial scars inconspicuous, 6–11 x 2–3 μ m. Conidia pale olivaceous brown, obclavate, or obclavato-cylindrical, straight or slightly curved, strictly 3 septate, tip rounded, base slightly obconically truncate, 22–36 x 2–2.5 μ m.

Habitat: On leaves of *Cassia alata* (Leguminosae), Singapore, leg. G. Lim (No. S.U. 66bis), Jan. 5, 1971.

Note: This species is different from others by its continuous conidiophores and its strictly 3 septate conidia.

52. *Pseudocercospora centrosematicola* (Yen & Lim) Yen, comb. nov. (Fig. 33)

= *Cercospora centrosematicola* Yen & Lim, Cahiers du Pacifique 17:101, 1973.

Leaf spots irregularly angular, brown, with an indefinite yellowish border, more distinct on the upper side, scattered, 1–4mm in diam. Fruiting amphigenous, invisible. Stromata usually forming inside the epidermal cells, sometimes under the epidermal cells, dark brown, globose or irregularly globose, 20–45 μ m in diam. Fascicles dense, emerging through rupture of the epidermal cells. External hyphae hypophyllous, emerging through the stomata, pale olivaceous brown, septate, branched, 1.5–2.5 μ m in width. Conidiophores may be divided into two

kinds: A, conidiophores arising from fascicles, amphigenous, olivaceous brown, simple when young, branched when old, continuous or 1-7 septate, 0-3 geniculate, apex irregularly rounded or shortly attenuate, a small unthickened conidial scar at the tip, 12-65 x 3.5-4 μ m; B, conidiophores arising from the external hyphae, hypogenous, olivaceous brown, always simple, erect or slightly curved, generally continuous, sometimes 1 septate, apex slightly attenuate and truncate, 6-30 x 3.5-4 μ m. Conidia pale olivaceous brown, filiform or obclavato-cylindrical, straight or slightly curved, apex subobtuse, 3-12 septate, base obconically truncate, 50-127 x 2-3 μ m.

Habitat: On leaves of *Centrosema pubescens* (Leguminosae), Sembawang, Singapore, leg. G. Lim (No. S.U. 72), Dec. 1971.

Note: *Cercospora cylindrospora* Stev. & Solh. and *C. centrosemae* Chupp & Muller are different from this species by their strictly hypophyllous fruiting. *Pseudocercospora bradburyae* (Young) Deighton and *Cercospora clitoria* Atk. differ from this fungus by their strictly epiphyllous fruiting.

53. *Pseudocercospora chrysanthemicola* (Yen) Deighton (Fig. 34)
Mycol. Papers 140:141, 1976.

= *Cercospora chrysanthemicola* Yen, Revue de Mycol. 29:215, 1964.

Leaf spots circular, sometimes oblong up to 30mm, generally scattered, 3-10mm in diam., at first yellowish on upper side and grayish brown on the lower side, then becoming dark brown with brown margin on the under surface. Fruiting amphiphyllous invisible. Stromata amphigenous, substomatal, dark brown, globular, 22-60 μ m in diam. Fascicles poor to dense (2-20 stalks), filling stomatal opening. Conidiophores amphiphyllous, simple, not branched, olivaceous brown, cylindrical, erect or tortuous, an unthickened scar at the rounded tip, 0-5 septate, 0-2 geniculate, 20-110 x 3.6-6 μ m. Conidia pale olivaceous brown, obclavate or obclavato-cylindrical, straight or slightly curved, 1-5 septate, tip rounded, base obconically truncate, 31.2-92.4 x 3.6-5 μ m.

Habitat: On leaves of *Chrysanthemum sinense* (Compositae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 17), Apr. 10, 1964.

Note: *Cercospora chrysanthemi* Heald & Wolf differs from this fungus by its hyaline and acicular conidia.

54. *Pseudocercospora columnaris* (Ell. & Ev.) Yen, comb. nov.

= *Cercospora columnaris* Ell. & Ev., Proc. Acad. Nat. Phila. 46:380, 1894.

Syn. *Isariopsis griseola* Sacc., Michelia 1:273, 1878.

Graphium laxum Ellis, Torrey Bot. Club 8:64-66, 1881.

Arthrobotryum puttemansii P. Henn., Hedwigia 41:309, 1902..

Cercospora stuhlmanni P. Henn., Bot. Jahrb. v. Engler, 33:40, 1904.

Phaeoisariopsis griseola (Sacc.) Ferr., Ann. Mycol. 7:273, 1909.

Leaf spots distinct, angular brown to grayish brown, strictly vein-limited, 2–5mm in diam. Fruiting amphigenous or only hypophyllous, often effuse, appearing as short black brown hairs or a dark gray velvet. Stromata none or very rudimentary. Fascicles dense to very dense. Conidiophores olivaceous brown, simple, cylindrical, or filamentous, 1–9 septate, not geniculate, tip rounded or attenuate and truncate, conidial scars inconspicuous, $220\text{--}410 \times 3.6\text{--}6\mu\text{m}$. Conidia crescent, attenuate at both ends, pale olivaceous brown, generally 3 septate (sometimes 5–6 septate), with constrictions at septa, apex rounded-conic, base obconico-truncate, $30\text{--}60 \times 4\text{--}7\mu\text{m}$.

Habitat: On leaves of *Phaseolus vulgaris* (Leguminosae), Jurong, Singapore, leg. Lin Shu-ling, Dec. 10, 1968.

Distribution: Africa, N. America, China, Europe, Hawaii, Japan, Puerto Rico, Singapore and Trinidad.

55. *Pseudocercospora cordiicola* (Yen) Yen, comb. nov. (Fig. 35)

= *Cercospora cordiicola* (Yen) Yen, Revue de Mycol. 32:182, 1967a.

Syn. *Cercospora cordiae* Yen, Revue de Mycol. 29:216, 1964.

non *Cercospora cordiae* Chupp, Monogr. Univ. P.R. Ser. B, 2:245, 1934.

Leaf spots indistinct, sometimes appearing as small angular dark brown speckles. Fruiting amphiphyllous, invisible. Stromata lacking or very rudimentary. Fascicles poor to meagre (2–9 stalks), filling stomatal openings. External hyphae pale olivaceous brown, emerging through the stomata, septate, branched, $2\text{--}2.5\mu\text{m}$ in width. Conidiophores may be classified into two kinds: A, conidiophores coming from fascicles, simple or branched, tortuous, olivaceous brown, paler and more narrow towards the tip, 1–3 septate, 0–2 geniculate, with unthickened conidial scar at the tip, $22.4\text{--}32.4 \times 3.6\text{--}4.8\mu\text{m}$; B, conidiophores arising from external hyphae, olivaceous brown, 0–2 septate, 0–1 geniculate, $13\text{--}24 \times 3.6\text{--}4.8\mu\text{m}$. Conidia filiform or obclavato-acicular, hyaline, curved, 4–8 septate, tip acute, base obconically truncate, $79.2\text{--}126 \times 1.5\text{--}2.4\mu\text{m}$.

Habitat: On leaves of *Cordia cylindristachya* (Boraginaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 28), Apr. 24, 1964.

56. *Pseudocercospora crotalaricola* (Yen) Yen, comb. nov. (Fig. 36)

= *Cercospora crotalaricola* Yen, Revue de Mycol. 29:220, 1964.

Leaf spots none or indistinct. Fruiting amphigenous, invisible. Stromata lacking. Fascicles poor to meagre (2–8 stalks), filling stomatal openings. External hyphae pale olivaceous brown, also filling stomatal openings, septate, branched, $2.4\text{--}4\mu\text{m}$ in width. Conidiophores may be divided into two kinds: A, conidiophores coming from fascicles, straight or tortuous, single or branched, olivaceous brown, 1–5 septate, 0–2 geniculate, with constrictions at septa, tip rounded, thickened conidial scars inconspicuous, $36\text{--}149 \times 4.8\text{--}7.8\mu\text{m}$; B, conidiophores as single branches from procumbent threads, olivaceous brown, 1–3 septate, not geniculate, tip rounded, $36\text{--}48 \times 4.5\text{--}7\mu\text{m}$. Conidia acicular, cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or undulate, 5–12 septate, tip conic or rounded, base obconically truncate, $10\text{--}134 \times 3.5\text{--}5\mu\text{m}$.

Habitat: On leaves of *Crotalaria striata* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 33), Apr. 25, 1964.

57. *Pseudoercospora cruenta* (Sacc.) Deighton (Fig. 11)

Mycol. Papers 140:142, 1976.

= *Cercospora cruenta* Sacc., *Michelia* 2:149, 1880.

(*Mycosphaerella cruenta* (Sacc.) Latham, *Mycologia* 26:516, 1934).

Cercospora phaseolorum Cooke, *Grevillea* 12:30, 1883.

Cercospora vignae Ell. & Ev., *J. Mycol.* 3:19, 1887.

Cercospora dolichi Ell. & Ev., *J. Mycol.* 68:72, 1889.

Cercospora vignae Raciborski, *Zeit. Pflanzenkr.* 8:66, 1898.

Cercospora lusioniensis Sacc., *Ann. Mycol.* 12:314, 1914.

Cercospora raciborskii Mats. & Nag., *J. Plant Protect. (Byochugai-zashi)* 18:714-722, 1931.

Cercospora vignae-sinensis Tai & Wei, *Sinensia* 4:126, 1933.

Cercospora neovignae Yamam., *Trans. Sapporo Nat. Hist. Soc.* 13:142, 1934.

Cercospora vignae-sinensis Sawada, *Descr. Cat. Formosan Fungi* 8:125, 1934.

Leaf spots circular to irregular, 1–10mm in diam., yellowish to rusty brown or blood red, sometimes concentric with gray centre and somewhat darker margin, often confluent. Fruiting amphigenous, but mainly hypophyllous, sometimes distinctly effuse. Stromata rudimentary or small, filling stomatal openings, olivaceous brown. Fascicles medium to dense, emerging through the stomata. Conidiophores simple, straight or subflexuous, pale olivaceous brown, 0–3 septate, 1–3 geniculate, an unthickened small conidial scar at the conic tip, 10–75 x 3–5 μ m. Conidia cylindrical or obclavato-ylindrical, pale olivaceous brown, straight or slightly curved, 4–14 septate, tip rounded, base sharply obconic and subtruncate, 25–50 x 2–5 μ m.

Habitat: On leaves of *Vigna sinensis* (Leguminosae), Taiping, Singapore, leg. Jo-min Yen, Dec. 30, 1965; on *V. sinensis*, Jurong, Singapore, leg. Lin Shu-ling, Dec. 10, 1968; on *V. sinensis*, Singapore, leg. G. Lim, Apr. 11, 1969.

Distribution: N. & S. America, Ceylon, China, Europe, Japan and Singapore.

58. *Pseudocercospora daturina* (Yen) Deighton (Fig. 37)

Mycol. Papers 140:143, 1976.

= *Cercospora daturina* Yen, *Revue de Mycol.* 30:169, 1965.

Leaf spots none or indistinct. Fruiting amphigenous, invivisible. Stromata lacking. Fascicles poor to meagre (2–8 stalks), emerging through the stomata. Conidiophores amphiphylous, pale olivaceous brown, single or branched, erect

or tortuous, 1-4 septate, 1-3 geniculate, an unthickened small conidial scar at the attenuate tip, 30-80 x 4-6 μ m. Conidia cylindrical, pale olivaceous brown, straight or slightly curved, 3-10 septate, tip subconic, base obconic truncate, 51-123 x 3.5-5 μ m.

Habitat: On leaves of *Datura alba* (Solanaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 70), Aug. 4, 1964.

59. *Pseudocercospora delonicis* (Yen) Yen, comb. nov. (Fig. 38)

= *Cercospora delonicis* Yen, Revue de Mycol. 29:223, 1964.

Leaf spots none or indistinct. Fruiting amphigenous, sparingly effuse. Stromata lacking. External hyphae amphigenous, filling stomatal openings, pale olivaceous brown, septate, branched, 2-3.6 μ m in width. Conidiophores as solitary branches from procumbent threads, olivaceous brown, cylindrical, 0-3 septate, 0-1 geniculate, tip rounded, conidial scars inconspicuous, 6-31 x 2.5-3.5 μ m. Conidia cylindrical, pale olivaceous brown, straight or slightly curved, 1-6 septate, tip rounded, base attenuate and truncate, 40.5-61.2 x 2.5-4.5 μ m.

Habitat: On leaves of *Delonix regia* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 41), May 15, 1964.

60. *Pseudocercospora ervatamiae* (Yen & Lim) Yen, comb. nov. (Fig. 39)

= *Cercospora ervatamiae* Yen & Lim, Bull. Soc. Mycol. Fr. 86:745, 1970b.

Leaf spots irregular, brown to dark brown, with an indefinite yellowish border, scattered, 0.5-5mm in diam., sometimes confluent. Fruiting amphiphylous, appearing as black minute pustules under hand lens. Stromata well developed, black brown, globose, 15-40 (-60) μ m in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores pale olivaceous brown, very short, simple, sometimes branched, erect, rarely with one geniculation, continuous, sometimes one septate, apex attenuate and truncate, conidial scars inconspicuous, 12-25 x 3-4 μ m. Conidia cylindrical, pale olivaceous brown, straight or slightly curved, 1-6 septate, apex rounded, base attenuate and truncate, 28-80 x 3-4 μ m.

Habitat: On leaves of *Ervatamia coronaria* (Apocynaceae), Singapore, leg. G. Lim, Mar. 11, 1970.

Note: *Pseudocercospora tabernaemontanae* (H. & P. Syd.) Deighton sometimes resembles this fungus, but it is different from this species by its big "shot-hole" leaf spots and especially by its branched and septate conidiophores.

61. *Pseudocercospora eupatorii-formosani* (Saw.) Yen, comb. nov. (Fig. 16, A-C)

= *Cercospora eupatorii-formosani* Sawada, Taiwan Agr. Res. Inst. 86:169, 1943.

Leaf spots brown, angular, vein-limited, small, scattered, 2-4mm in diam., rarely confluent. Fruiting amphiphylous, invisible. Stromata black brown, globose or subglobose, 18-57.5 μ m in diam. Fascicles dense to very dense (10-30 stalks), emerging through the stomata. Conidiophores amphigenous, short, pale

brown, simple, slightly flexuous, continuous, rarely one-septate, tip rounded or shortly attenuate and truncate, conidial scars inconspicuous, $18\text{--}26.5 \times 3\text{--}4.8\mu\text{m}$. Conidia cylindrical or filiform, pale olivaceous brown, slightly curved, 3–10 septate, tip conic, base slightly obconic-truncate, $34\text{--}110 \times 2.5\text{--}3.5\mu\text{m}$.

Habitat: On leaves of *Eupatorium odoratum* (Compositae), Ipoh, Malaysia, leg. Jo-min Yen (No. M.S. 728), Dec. 21, 1965.

Distribution: Malaysia and Taiwan.

62. *Pseudocercospora fici-chartaceae* (Yen & Lim) Yen, comb. nov. (Fig. 40)

= *Cercospora fici-chartaceae* Yen & Lim, Cahiers du Pacifique 14:97, 1970a.

Leaf spots circular with an indefinite border, orange brown with a black brown centre on the upper side, pale brown to yellowish brown on the lower side, 2–8mm in diam. Fruiting amphigenous, but chiefly epiphyllous. Stromata epigenous and endogenous within an epidermal cell, globose or subglobose, $21.5\text{--}40\mu\text{m}$ in diam. Fascicles poor to dense (2–20 stalks), emerging through rupture of epidermal cells. Conidiophores usually epigenous, but sometimes hypogenous and emerging through the stomata, simple, erect, dark brown, 2–7 septate, not geniculate, tip rounded and paler, conidial scars indistinct, $60\text{--}124 \times 4.5\text{--}6\mu\text{m}$. Conidia obclavate, sometimes obclavato-cylindrical, pale olivaceous brown, straight or curved, at times crescent, 3–5 septate, tip rounded, base obconic-truncate, $39.5\text{--}70 \times 3.5\text{--}5\mu\text{m}$.

Habitat: On leaves of *Ficus chartacea* (Moraceae), Bukit Timah, Singapore, leg. G. Lim, Apr. 4, 1969.

63. *Pseudocercospora formosana* (Yamam.) Deighton (Fig. 41)

Mycol. Papers 140:144, 1976.

= *Cercospora formosana* Yamam., J. Soc. Trop. Agr. 6:600, 1934.

Syn. *Cercospora lantana-aculeatae* Yen, Revue de Mycol. 31:124, 1966.

Leaf spots small, angular, vein-limited, black brown on the upper side, brown on the lower side, scattered, 0.5–2mm in diam. Fruiting hypophyllous, invisible. Stromata lacking. External hyphae emerging through the stomata, pale olivaceous brown, septate, branched, $1.5\text{--}2.5\mu\text{m}$ in width. Conidiophores may be divided into two kinds: A, conidiophores arising from poor fascicles (2–6 stalks), simple or branched, pale olivaceous brown, straight or flexuous, 0–2 geniculate, 1–3 septate, sometimes with constrictions at septa, tip attenuate and truncate, sometimes shouldered, conidial scars inconspicuous, $12\text{--}36 \times 3.5\text{--}5\mu\text{m}$; B, conidiophores as solitary branches from external hyphae, not branched, pale olivaceous brown, straight or slightly flexuous, 0–2 septate, 0–2 geniculate, tip attenuate and truncate, $5\text{--}28 \times 2.5\text{--}3.6\mu\text{m}$. Conidia filiform, pale olivaceous brown, slightly curved, 2–6 septate, tip obtuse, base obconic-truncate, $36\text{--}82 \times 2\text{--}3\mu\text{m}$.

Habitat: On leaves of *Lantana aculeata* (Verbenaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 86), Sept. 20, 1964.

Distribution: Singapore and Taiwan.

64. *Pseudocercospora globosae* (Yen) Deighton (Fig. 42)

Mycol. Papers 140:144, 1976.

= *Cercospora globosae* Yen, Revue de Mycol. 29:224, 1964.

Leaf spots none or indistinct. Fruiting amphigenous, effuse, dark gray. Stromata amphigenous, brown, in shape of dumb-bell, each end globular, 15.5–33.5 μ m in diam. Fascicles dense, filling stomatal openings. Conidiophores simple or branched, tortuous, olivaceous brown, 0–3 geniculate, 0–6 septate, conidial scars inconspicuous, tip attenuate and truncate, 31–111.5 x 3.5–6 μ m. Conidia acicular or filiform, pale olivaceous brown, straight or curved, 2–12 septate, tip conic, base obconic-truncate, 62.5–150 x 2.5–3.5 μ m.

Habitat: On leaves of *Gomphrena globosa* (Amaranthaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 19), Apr. 20, 1964.

Note: *Cercospora gomphrenicola* Speg. resembles this fungus by the indistinct leaf spots, but differs from it by its mostly one septate and constricted conidia.

65. *Pseudocercospora hiratsukana* (Tog. & Kats.) Deighton

Mycol. Papers 140:34, 1976.

= *Cercospora hiratsukana* Tog. & Kats., J. Jap. Bot. 28:286, 1953.

Leaf spots subcircular or irregular, brown with an indefinite border, frequently confluent and forming large patches. Fruiting amphigenous, but chiefly hypophyllous. Stromata amphigenous, olivaceous brown, globose, 24–64 μ m in diam. Fascicles dense to very dense. Conidiophores very short, pale olivaceous brown, continuous, tip attenuate and truncate, conidial scars unthickened, 6–10 x 2.5–3 μ m. Conidia subhyaline or very pale olivaceous brown, cylindrical, straight or mildly curved, 2–5 septate, tip rounded or subobtuse, base slightly attenuate and truncate, 31–62 x 1.5–2.5 μ m.

Habitat: On leaves of *Dioscorea* sp. (Dioscoreaceae), Botanic Garden, Singapore, leg. Mrs. Shu-hsien Yen (No. 54bis), Jun. 7, 1964.

Distribution: Japan and Singapore.

66. *Pseudocercospora ipomoeae-purpureae* (Yen) Yen, comb. nov. (Fig. 43)

= *Cercospora ipomoeae-purpureae* Yen, Revue de Mycol. 30:173, 1965.

Leaf spots circular to angular, dark brown, more distinct on the upper side, scattered, 0.5–3mm in diam. Fruiting amphiphyllous, but more abundant on the lower surface. Stromata amphigenous, small, brown or dark brown, globose, 18–40 μ m in diam. Fascicles medium to very dense (6–30 stalks), emerging through the stomata. Conidiophores amphiphyllous, simple or branched, straight or flexuous, olivaceous brown or pale olivaceous brown, 0–1 geniculate, 0–2 septate, with constrictions at the septa, small unthickened conidial scars at the rounded or attenuate and truncate tip, 22–35 x 3.5–4.8 μ m. Conidia cylindrical or obclavate-cylindrical, pale olivaceous brown, straight or slightly curved, 3–11 septate, tip rounded or subconic, base obconic-truncate, 40–120 x 3–4 μ m.

Habitat: On leaves of *Ipomoea purpurea* (Convolvulaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 72), Apr. 4, 1964.

67. *Pseudocercospora ixoricola* (Yen) Yen, comb. nov. (Fig. 44)

= *Cercospora ixoricola* Yen, Revue de Mycol. 31:119, 1966.

Leaf spots distinct, angular or irregular, with an indefinite border, reddish brown on upper side, yellowish brown on lower side, centre whitish and zonate, frequently vein-limited, scattered, 3–14mm in diam., sometimes confluent. Fruiting hypophyllous, invisible. Stromata lacking or very poor. Fascicles poor to meagre (2–8 stalks), emerging through the stomata. Conidiophores hypophyllous, brown, unicolour, simple or branched, erect or slightly flexuous, 0–2 geniculate, 3–5 septate, with constrictions at the septa, tip rounded or attenuate-truncate, conidial scars inconspicuous, 38.5–78 x 3.5–5 μ m. Conidia obclavate, pale olivaceous brown, straight or slightly curved, 3–10 septate, tip obtuse to acute, sometimes rounded, base obconic-truncate, 44–138 x 3.5–5 μ m.

Habitat: On leaves of *Ixora javanica* (Rubiaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 117), May 12, 1965.

Note: *Pseudocercospora ixorae* (Solh.) Deighton differs from this species by its amphiphyllous fruiting and cylindrical conidia.

68. *Pseudocercospora jasminicola* (Muller & Chupp) Deighton

Mycol. Papers 140:74, 1976.

= *Cercospora jasminicola* Muller & Chupp, Arch. Inst. Biol. Veg. Rio de Janeiro 3:93, 1936.

Leaf spots circular, brown with a reddish brown border, more distinct on the upper side, scattered, 1–3mm in diam., sometimes coalescing and forming large patches. Fruiting amphigenous, but chiefly hypogenous, visible as minute black pustules under hand lens. Fascicles poor or mildly dense (3–16 stalks), emerging through the stomata. Conidiophores olivaceous brown, simple, never branched, straight or flexuous, 1–2 geniculate, 2–6 septate, with constrictions at septa, tip attenuate and truncate, sometimes shouldered, conidial scars indistinct, 5–50 x 2–4 μ m. Conidia obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, 1–4 septate, tip obtuse, base obconically subtruncate, 24–60 x 2–3 μ m.

Habitat: On leaves of *Jasminum grandiflorum* (Oleaceae), Katong, Singapore, leg. Jo-min Yen (No. M.S. 732), Jan. 18, 1966.

Distribution: Brazil, India, Singapore and Taiwan.

69. *Pseudocercospora jatrophae-curcas* (Yen) Deighton (Fig. 45)

Mycol. Papers 140:146, 1976.

= *Cercospora jatrophae-curcas* Yen, Revue de Mycol. 30:176, 1965.

Leaf spots none or indistinct, fruiting amphiphylous, but more abundant on the lower surface, invisible. Stromata lacking or very small, consisting of few dark brown cells. Fascicles poor to dense (2–20 stalks), emerging through the stomata. External hyphae pale brown, filling the stomatal openings, septate, branched, 2–2.5 μm in width. Conidiophores either coming from fascicles or arising from external hyphae, pale brown, simple or branched, generally tortuous, 0–4 septate, 0–3 geniculate, with constrictions at septa, tip attenuate and truncate, (5–) 18–48 x 3–5 μm . Conidia cylindrical, pale olivaceous brown, slightly curved, 3–7 septate, tip rounded, base obconic-truncate, 42–102 x 2.5–3.5 μm .

Habitat: On leaves of *Jatropha curcas* (Euphorbiaceae), in Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 55), Jun. 7, 1964.

70. *Pseudocercospora katongensis* (Yen) Yen, comb. nov. (Fig. 46)

= *Cercospora katongensis* Yen, Revue de Mycol. 31:120, 1966.

Leaf spots none or indistinct, sometimes mixed with spots of *Cercospora hydrangeae* Ell. & Ev. Fruiting hypogenous, invisible. Stromata poor or small, black brown, globular, 13.5–36 μm in diam. Fascicles poor to very dense (2–32 stalks), emerging through the stomata. Conidiophores hypophyllous, pale olivaceous brown, simple or branched, straight or mildly flexuous, not geniculate, 0–3 septate, sometimes with constrictions at septa, tip rounded, conidial scars inconspicuous, 25–36 x 2.5–3.6 μm . Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, sometimes with a geniculation, 3–8 septate, tip subrounded, base obconic truncate, 36–90 x 2.5–3.6 μm .

Habitat: On leaves of *Hydrangea macrophylla* (Hydrangeaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 95), Dec. 18, 1964; on the same host plant, leg. Lee Chih-shao & Mrs. Shu-hsien Yen (No. 109), Apr. 18, 1965.

Note: *Cercospora hydrangeae* Ell. & Ev. differs from this species by its amphigenous fruiting and hyaline conidia.

71. *Pseudocercospora lyciicola* (Yen) Yen, comb. nov. (Fig. 47)

= *Cercospora lyciicola* Yen, Revue de Mycol. 30:180, 1965.

Leaf spots indistinct, sometimes appearing as yellow areas on the upper side and dark gray areas on the lower side. Fruiting amphigenous, invisible. Fascicles poor to very dense (2–30 stalks), emerging through the stomata. Stromata sub-stomatous, globular or irregular, dark brown, 30–46 μm in diam. Conidiophores amphiphylous, pale brown to brown, paler towards the tip, simple or branched, straight or tortuous, 1–4 septate, with constrictions at septa, unthickened small conidial scar at the attenuate and truncate tip, 23–78 x 3.5–5.5 μm . Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, 3–13 septate, tip rounded, base obconic truncate, 33.5–148 x 3.6–6 μm .

Habitat: On leaves of *Lycium chinense* (Solanaceae), Geylang, Singapore, leg. Mrs. Shu-hsien Yen (No. 65), Jun. 28, 1964.

Note: *Cercospora chengtuenensis* Tai and *C. lycii* Ell. & Hals. are different from this fungus by their strictly hypogenous fruitings.

72. *Pseudocercospora macarangae* (H. & P. Syd.) Deighton (Fig. 48)

Mycol. Papers 140:47, 1976.

= *Cercospora macarangae* H. & P. Syd., Ann. Mycol. 12:575, 1914.

Syn. *Cercospora macarangae* Yen & Lim, Bull. Soc. Mycol. Fr. 86:748, 1970b.

Leaf spots distinct, circular, brown to dark brown, with an indefinite border, more distinct on the lower side, scattered, 2–7mm in diam., sometimes confluent. Fruiting epiphyllous, visible as black minute pustules under hand lens. Stromata globose, black brown, usually above the stomata, 25–40 μ m in diam. Fascicles poor to dense (2–25 stalks), emerging through the stomata. Conidiophores brown, paler toward the tip, simple, never branched, erect or flexuous, 1–10 septate, apex rounded or slightly truncate, 20–200 x 4–5 μ m. Conidia obclavate, pale olivaceous brown, straight or slightly curved, 2–6 septate, tip obtuse or subacute, base obconically truncate, 22–72 x 4–5 μ m.

Habitat: On leaves of *Macaranga indica* (Euphorbiaceae), Singapore, leg. G. Lim, Nov. 28, 1969.

73. *Pseudocercospora mori* (Hara) Deighton

Mycol. Papers 140:148, 1976.

= *Cercospora mori* Hara, J. Sericult. Assoc. Japan 27:227, 1918.

Syn. *Cercospora mori* Mar. & Stey., Bull. Soc. Roy. Bot. de Belg. 61 (N.S. 11):166, 1929.

Leaf spots none or indistinct. Fruiting strictly hypophyllous, scantily effuse, olivaceous gray to dark brown. Stromata lacking or consisting of few brown cells. Fascicles lacking or very poor (2–6 stalks), emerging through the stomata. External hyphae hypogenous, filling stomatal openings, olivaceous brown, septate, branched, 2–2.5 μ m in width. Conidiophores (either arising from fascicles or from external hyphae) simple or branched, erect or slightly flexuous, 1–2 geniculate, 1–4 septate (occasionally 7–8 septate), brown, paler toward the apex, tip sharply attenuate, conidial scars inconspicuous, 19–71 x 3.5–5.5 μ m (occasionally to 148 μ m long). Conidia obclavate, but obclavato-cylindrical for the short ones, pale olivaceous brown, 3–8 septate, straight or mildly curved, tip acute or obtuse, base obconically truncate, 20–80 (–108) x 3.5–5 μ m.

Habitat: On leaves of *Morus alba* (Moraceae), Bukit Timah, Singapore, leg. Jo-min Yen (No. M.S. 648), Nov. 25, 1965.

Distribution: N. America, Belgium Congo, Japan, W. Pakistan, Singapore and Taiwan.

74. *Pseudocercospora muntingiae* (Petr. & Cif.) Deighton

Mycol. Papers 140:148, 1976.

= *Cercospora muntingiae* Petr. & Cif., Ann. Mycol. 30:324, 1932.

Leaf spots distinct, angular to irregular, reddish brown with a yellowish margin, scattered, 0.5–5mm in diam. Fruiting epiphyllous, invisible. Stromata dark brown, globose or subglobose, small, 10–25 μ m in diam. Fascicles medium to dense. Conidiophores pale olivaceous brown, uniform in colour and in width, sparingly septate, not geniculate not branched, undulate or bent variously, unthickened conidial scars at the rounded to conic tip, 10–35 x 2–4 μ m. Conidia obclavato-cylindrical, pale olivaceous brown, straight or curved, 2–8 septate, tip rounded, base subtruncate to obconically truncate, 20–65 x 2–4 μ m.

Habitat: On leaves of *Muntingia calabura* (Elaeocarpaceae), Bukit Timah, Singapore, leg. G. Lim, Apr. 4, 1969.

Distribution: N. America, San Domingo and Singapore.

75. *Pseudocercospora peltophori* (Yen) Yen, comb. nov. (Fig. 49)

= *Cercospora peltophori* Yen, Revue de Mycol. 29:228, 1964.

Leaf spots none or indistinct. Fruiting hypophyllous, invisible. Stromata lacking. Fascicles lacking or very poor (2–4 stalks), emerging through the stomata. Conidiophores hypogenous, either coming from fascicles or arising from procumbent threads, pale olivaceous brown, simple or branched, erect or tortuous, 0–4 septate, 0–2 geniculate, tip conic, conidial scars inconspicuous, 10–36 x 3–5 μ m. External hyphae hypogenous, pale olivaceous brown, filling stomatal openings, septate, branched, 2–3.5 μ m in width. Conidia pale olivaceous brown, obclavato-cylindrical or subacicular, slightly curved or undulate, 3–6 septate, tip conic, base obconically truncate, 31–72 x 2.5–3.5 μ m.

Habitat: On leaves of *Peltophorum pterocarpum* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 37), May 7, 1964.

76. *Pseudocercospora pergulariae* (Yen & Lim) Yen, comb. nov. (Fig. 50)

= *Cercospora pergulariae* Yen & Lim, Cahiers du Pacifique 14:100, 1970a.

Leaf spots angular or irregular, more distinct on the lower side, vein-limited, black brown on the upper side, black on under side, scattered, 1–4mm in diam. Fruiting strictly hypophyllous, appearing as black carpet on the lower surface of the spots. Stromata black brown, globose, 24–40 μ m in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores hypophyllous, dark brown, simple, not branched, erect or flexuous, 0–4 septate, 0–2 geniculate, tip attenuate and truncate, conidial scars inconspicuous, 30–91 x 5–6 μ m. Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown to brown, straight or slightly curved, with a finely granulated membrane, 1–5 septate, tip rounded, base obconically truncate, 40–91 x 4.5–5.5 μ m.

Habitat: On leaves of *Pergularia minor* (Asclepiadaceae), Bukit Timah, Singapore, leg. G. Lim, Apr. 11, 1969.

77. *Pseudocercospora phyllanthi-niruri* (Yen) Yen, comb. nov. (Fig. 51).

= *Cercospora phyllanthi-niruri* Yen, Revue de Mycol. 32:192, 1967a.

Syn. *Cercospora phyllanthicola* Yen, Revue de Mycol. 30:186, 1965.

non *Cercospora phyllanthicola* Shakil & Kamal, Indian Phytopath. 15:296, 1962.

Leaf spots none or indistinct. Fruiting hypophyllous, effuse, gray, often extending and covering the whole lower surface of the leaf. Stromata lacking. Conidiophores olivaceous brown, simple or branched, erect or flexuous, 1–5 septate, 1–3 geniculate, at times with constrictions at septa, unthickened small conidial scar at the rounded tip, $54\text{--}126 \times 4.5\text{--}6\mu\text{m}$. Conidia crescent shaped, pale olivaceous brown, generally 3 septate, tip rounded, base slightly attenuate and truncate, $45\text{--}60 \times 4.5\text{--}6\mu\text{m}$.

Habitat: On leaves of *Phyllanthus niruri* (Euphorbiaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 18), Apr. 1, 1964.

Note: This fungus is different from *Cercospora phyllanthicola* Shakil & Kamal and *Pseudocercospora phyllanthi* (Chupp) Deighton by its crescent shaped and 3 septate conidia.

78. *Pseudocercospora piperina* (Yen) Yen, comb. nov. (Fig. 52)

= *Cercospora piperina* Yen, Revue de Mycol. 31:131, 1966.

Leaf spots distinct, circular, dark brown with grayish brown centre on the upper side, surrounded by a raised border, olivaceous brown with an indefinite margin on the lower side, scattered, 2–10mm in diam. Fruiting amphiphyllous, but more abundant on the upper side, appearing as minute black pustules in the centre of leaf spots. Fascicles dense to very dense. Stromata black brown, globular to irregularly globular, $36\text{--}76\mu\text{m}$ in diam.. Conidiophores amphiphyllous, always simple, cylindrical, straight, continuous (rarely one septate), laterally shouldered at the tip, pale olivaceous brown, tip generally rounded, conidial scars inconspicuous, $21\text{--}30 \times 2.5\text{--}6\mu\text{m}$. Conidia cylindrical, pale olivaceous brown, generally straight, at times slightly curved, 3–6 septate, tip rounded, base truncate, $38.5\text{--}73.5 \times 3\text{--}4.5\mu\text{m}$.

Habitat: On leaves of *Piper muricatum* (Piperaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 105), Feb. 15, 1965.

Note: *Cercospora cartanthes* P. Henn. resembles somewhat this fungus, but is different from this species by its hypogenous fruiting and obclavate conidia.

79. *Pseudocercospora piperis-muricati* (Yen) Yen, comb. nov. (Fig. 53)

= *Cercospora piperis-muricati* Yen, Revue de Mycol. 31:134, 1966.

Leaf spots circular or irregularly circular, dark brown, with an indefinite border on the upper side, pale brown on the lower side, scattered, 2–8mm in diam. Fruiting strictly hypogenous, invisible. Stromata lacking or very rudimentary. Fascicles hypophyllous, poor to dense (5–28 stalks), emerging through the stomata. Conidiophores olivaceous brown or pale olivaceous brown, simple or branched, straight or tortuous, 1–3 septate, 0–1 geniculate, tip long attenuate and truncate, conidial scars inconspicuous, $30\text{--}56.5 \times 3.5\text{--}4.8\mu\text{m}$. Conidia cylindrical, generally straight, sometimes slightly curved, pale olivaceous brown, 1–5 septate, tip rounded, base slightly attenuate and truncate, $31\text{--}65 \times 2\text{--}3.5\mu\text{m}$.

Habitat: On leaves of *Piper muricatum* (Piperaceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 103bis), Feb. 15, 1965; on same host plant, Bukit Timah, Singapore, leg. Mrs. Shu-hsien Yen (No. 105bis), Mar. 19, 1965.

Note: *Cercospora piperata* Asth. & Mah. resembles somewhat this species, but differs from it by its continuous and unbranched conidiophores and especially by its obclavate conidia.

80. *Pseudocercospora psophocarpi* (Yen) Deighton (Fig. 30, D-G)

Mycol. Papers 140:151, 1976.

= *Cercospora psophocarpi* Yen, Bull. Soc. Mycol. Fr. 83:338, 1967b.

Leaf spots distinct, circular with an indefinite border, brown on upper side, olivaceous brown on lower side, scattered, 3–10mm in diam., sometimes confluent. Fruiting amphigenous, mostly epiphyllous, visible as minute black pustules under hand lens. Stromata black brown, irregularly globose, 24–57.5 μ m in diam. Fascicles dense to very dense. Conidiophores pale olivaceous brown, simple, short, erect or slightly tortuous, continuous, not geniculate, tip shortly attenuate, 13–28 x 3–4 μ m. Conidia cylindrical, pale olivaceous brown, curved, 1–6 septate, sometimes with slight constrictions at septa, tip rounded, base attenuate and truncate, 25.5–54 x 4–6 μ m.

Habitat: On leaves of *Psophocarpus tetragonolobus* (Leguminosae), Jurong, Singapore, leg. Jo-min Yen (No. 717bis), Dec. 31, 1965.

Note: This species differs from *Pseudocercospora aranetae* (Borl. & Rold.) Yen by its well developed stromata and continuous conidiophores.

81. *Pseudocercospora pterocarpicola* (Yen) Yen, comb. nov. (Fig. 54)

= *Cercospora pterocarpicola* Yen, Revue de Mycol. 42:145, 1978.

Leaf spots distinct, orbicular, yellowish brown, 1–2mm in diam. Fruiting strictly hypophyllous, invisible. Stromata rather developed, substomatic, globose or irregularly globose, 25–40 μ m in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores hypophyllous, always simple, erect or flexuous, brown, paler toward the apex, 1–16 septate, 0–3 geniculate, tip rounded, conidial scars inconspicuous, 35–203 x 4 μ m. Conidia obclaviform, pale olivaceous brown, generally curved, 3–7 septate, tip conic or conic rounded, base obconically

Habitat: On leaves of *Pterocarpus indicus* (Leguminosae), Kuala Lumpur (For. Res. Inst.), Malaysia, leg. Jo-min Yen (No. 71341), Sept. 28, 1971.

82. *Pseudocercospora puerariicola* (Yamam.) Deighton (Fig. 55, A, C)

Mycol. Papers 140:151, 1976.

= *Cercospora puerariicola* Yamam., Phytopath. Lab. Taihoku Imp. Univ. Contr. 26:142, 1934.

Leaf spots subcircular to angular, at first pale brown, then becoming brown to dark brown, scattered, 1–3mm in diam., sometimes confluent. Fruiting amphiphyllous, chiefly epiphyllous. Stromata dark brown, globose, 26–50 μ m in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores olivaceous brown, simple, continuous, straight or slightly tortuous, unthickened conidial scars at the attenuate and truncate tips, 13–24 x 3.5–4.8 μ m. Conidia obclavato-cylindrical, pale olivaceous brown, midly curved, 3–6 septate, tip sub-obtuse, base obconically truncate, 40–66 x 3–4.5 μ m.

Habitat: On leaves of *Pueraria phaseoloides* (Leguminosae), Tanglin, Singapore, leg. Mrs. Shu-hsien Yen (No. 51), May 29, 1964.

Distribution: N. America, Japan, Singapore and Taiwan.

83. *Pseudocercospora puerariina* (Yen) Yen, comb. nov. (Fig. 55, B, D-H).
= *Cercospora puerariina* Yen, Revue de Mycol. 30:189, 1965.

Leaf spots more distinct on upper surface of the leaf, at first very small (0.5mm in diam.), gray, irregular or polygonal, vein-limited, then becoming yellow brown and more heavily coloured in the centre, 1–2mm in diam., sometimes becoming large brown areas. Fruiting amphigenous, more abundant on the lower side. Stromata lacking. Fascicles poor to meagre (2–12 stalks), emerging through the stomata. External hyphae pale brown, filling stomatal openings, septate, branched, 2–2.5 μ m in width. Conidiophores may be divided into two kinds: A, conidiophores coming from fascicles pale brown, paler at the tip, simple or branched, generally tortuous, 1–3 geniculate, 1–6 septate, with constrictions at septa, unthickened small conidial scar at the shortly attenuate tip, 30–53 x 4–6 μ m; B, conidiophores as solitary branches from procumbent threads, pale olivaceous brown, never branched, cylindrical, 0–2 septate, 0–1 geniculate, tip attenuate, 15–27.5 x 3.5–5 μ m. Conidia obclaviform or acicular, pale olivaceous brown, straight or slightly curved, 6–12 (–15) septate, tip acute, base obconically truncate, 90–200 x 3.5–5 μ m.

Habitat: On leaves of *Pueraria phaseoloides* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 44), Mar. 18, 1964.

Note: *Pseudocercospora puerariicola* (Yamam.) Deighton is different from this fungus by its continuous and always unbranched conidiophores.

84. *Pseudocercospora salicina* (Ell. & Ev.) Deighton (Fig. 56)
Mycol. Papers 140:94, 1976.

= *Cercospora salicina* Ell. & Ev., J. Mycol. 3:19, 1887.

Syn. *Cercospora babylonicae* Saw. Formosan Agr. Res. Inst. Rept. 87:79, 1944.

Cercospora minutipes Yen, Revue de Mycol. 31:128, 1966.

Cercospora salicis-babylonicae Yen, Revue de Mycol. 31:139, 1966.

Leaf spots amphigenous, subcircular or irregularly angular, more distinct on the upper side, dark brown, with an indefinite border, scattered, 0.5–4mm in diam., sometimes confluent. Fruiting amphigenous, visible as minute black pustules under hand lens, but sometimes invisible, even under hand lens. Stromata subepidermic, black brown, globose, 30–60 μ m in diam., but sometimes lacking. Fascicles poor to very dense. Conidiophores amphiphylous, brown to dark brown, short, simple, generally continuous, at times 1–2 septate, tip rounded or attenuate and truncate, conidial scars inconspicuous, 8.5–17 x 3–4.5 μ m. Conidia obclavato-cylindrical or fusiform for the short ones, pale olivaceous brown, straight or slightly curved, 1–6 septate, tip rounded, base obconically truncate, 18–60 x 2.5–3.5 μ m.

Habitat: On leaves of *Salix babylonica* (Salicaceae), Katong, Singapore leg. Mrs. Shu-hsien Yen (No. 92), Dec. 14, 1964.

Distribution: N. America, India, Japan, Singapore and Taiwan.

85. *Pseudocercospora scopariicola* (Yen) Deighton (Fig. 57)

Mycol. Papers 140:152, 1976.

= *Cercospora scopariicola* Yen, Bull. Soc. Mycol. Fr. 84:11, 1968.

Leaf spots none or indistinct. Fruiting amphigenous, effuse, visible as a thin gray velvet on the underside. Stromata lacking or very small, consisting of few brown cells. Fascicles meagre to dense (3–18 stalks), emerging through the stomata. External hyphae hypophyllous, very abundant, filling stomatal openings, pale brown, septate, branched, $2.5\text{--}3.5\mu\text{m}$ in width. Conidiophores (either arising from fascicles or from external hyphae), pale brown, simple or branched, 0–2 geniculate, 1–5 septate, with constrictions at septa, tip rounded or slightly attenuate and truncate, conidial scars inconspicuous, $12\text{--}48 \times 2.5\text{--}5\mu\text{m}$. Conidia cylindrical or obclavato-cylindrical, sometimes filiform, pale olivaceous brown, slightly curved, 3–13 septate, tip rounded or obtuse, base slightly obconically truncate, $67\text{--}165 \times 2.5\text{--}3.6\mu\text{m}$.

Habitat: On leaves of *Scoparia dulcis* (Scrophulariaceae), Taiping, Singapore, leg. Jo-min (No. M.S. 730), Dec. 30, 1965.

Note: *Cercospora scopariae* Lagy & Thir. differs from this fungus by the presence of leaf spots and absence of external hyphae and especially by the hyaline conidia.

86. *Pseudocercospora singaporensis* (Yen) Yen, comb. nov. (Fig. 58)

= *Cercospora singaporensis* Yen, Revue de Mycol. 29:237, 1964.

Leaf spots distinct, subcircular, yellowish gray to brownish gray, vein-limited on the upper side, scattered, 0.5–4mm in diam. Fruiting amphiphylous, invisible. Stromata lacking. Fascicles poor to medium (2–10 stalks), emerging through the stomata. Conidiophores olivaceous brown, simple or branched, erect or tortuous, 0–2 geniculate, 1–4 septate, a small unthickened conidial scar at the conic tip, $31\text{--}77 \times 4.5\text{--}5.5\mu\text{m}$. Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, generally 3 septate (rarely 1 or 4 septate), tip rounded base obconically truncate, $30\text{--}67 \times 3.5\mu\text{m}$.

Habitat: On leaves of *Cassia occidentalis* (Leguminosae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 16), Apr. 2, 1964.

Note: This fungus is different from *Pseudocercospora nigricans* (Cooke) Deighton by its distinct leaf spots and 3 septate conidia.

87. *Pseudocercospora stahlia* (F.L. Stev.) Deighton

Mycol. Papers 140:82, 1976.

= *Helminthosporium stahlia* F.L. Stev., Trans. Ill. Acad. Sci. 10:208, 1917.

Syn. *Cercospora stahlii* (Stev.) Subramanian, J. Indian Bot. Soc. 35:460, 1956.

Cercospora passiflorae-foetidae Yen, Revue de Mycol. 29:226, 1964.

Leaf spots hypophyllous, angular or irregular, vein-limited, dark gray on lower side, scattered, 1–6mm in diam. Fruiting amphiphyllous, but mostly hypophyllous, effuse, dark gray. Stromata small, pale brown, globose, 20–40 μ m in diam. Fascicles meagre to dense (2–18 stalks), filling stomatal openings. Conidiophores brown to dark brown, branched, 3–7 septate, 1–4 geniculate, apex long attenuate as sharp point, 78–153 x 5–7 μ m. Conidia clavate, pale olivaceous brown, paler toward the base, straight, 1–3 septate, tip rounded, base attenuate and subtruncate, 20.5–43 x 4–7 μ m.

Habitat: On leaves of *Passiflora foetida* (Passifloraceae), Katong, Singapore, leg. Mrs. Shu-hsien Yen (No. 23), Apr. 25, 1964.

Distribution: Africa, N. America, Brunei, India, Malaysia, New Guinea, Puerto Rico, Sabah, Singapore, Taiwan and Trinidad.

88. *Pseudocercospora stephanotidis* (Yen) Yen, comb. nov. (Fig. 59)

= *Cercospora stephanotidis* Yen, Revue de Mycol. 32:193, 1967a.

Leaf spots amphigenous, angular or irregular angular, more distinct on the lower side, vein-limited, brown to dark brown, with an indefinite border, scattered, 2–6mm in diam., sometimes confluent. Fruiting amphiphyllous, but chiefly hypophyllous, visible as black velvet on the lower surface of the spots. Stromata black brown globose, 30–60 μ m in diam. Fascicles dense to very dense, emerging through the stomata. Conidiophores brown or dark brown, paler toward the apex, simple or branched, erect or flexuous, 0–5 septate, 0–2 geniculate, tip rounded, membrane finely granulated, conidial scars inconspicuous, 30–80 x 6–7.5 μ m. Conidia obclavate or obclavato-cylindrical, brown or dark brown, straight or slightly curved, membrane finely granulated, 1–5 septate, tip rounded, base obconically truncate, 37–92 x 4.5–7 μ m.

Habitat: On leaves of *Stephanotis floribunda* (Asclepiadaceae), Serangoon Garden, Singapore, leg. Jo-min Yen (No. M.S. 729), Nov. 28, 1965.

89. *Pseudocercospora stigmaphyllicola* (Yen) Deighton (Fig. 60)

Mycol. Papers 140:153, 1976.

= *Cercospora stigmaphyllicola* Yen, Revue de Mycol. 30:192, 1965.

Leaf spots amphigenous, at first irregular, brown on upper side, but dark brown on lower side, at last coalescing and covering the whole surface of the leaf. Fruiting hypophyllous, invisible. Stromata lacking. Fascicles poor to medium (2–11 stalks), filling the stomatal openings. External hyphae hypogenous, abundant, emerging through the stomata, septate, branched, pale olivaceous brown, 1.5–2.5 μ m in width. Conidiophores hypophyllous, either arising from fascicles (poor to meagre, 2–6 stalks) or from external hyphae, simple (sometimes branched), straight or tortuous, 0–2 septate, 0–2 geniculate, apex attenuate and truncate or

laterally shouldered, conidial scars inconspicuous, $8.5\text{--}36 \times 3.5\text{--}4.5\mu\text{m}$. Conidia obclavato-cylindrical or cylindrical, pale olivaceous brown, straight or slightly curved, 2–7 (rarely 1 or 8) septate, tip obtuse, base obconically truncate, $38\text{--}113 \times 2\text{--}3\mu\text{m}$.

Habitat: On leaves of *Stigmaphyllon ciliatum* (Malpighiaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 57), Jun. 7, 1964.

90. *Pseudocercospora tabernaemontanae* (H. & P. Syd.) Deighton

Mycol. Papers 140:154, 1976.

= *Cercospora tabernaemontanae* H. & P. Syd., Philipp. J. Sci. (Bot.) 8:507, 1913.

Leaf spots distinct, circular, 3–10mm in diam., pale tan or dingy gray with a narrow brown border, often forming "shot-holes". Fruiting amphigenous, invisible. Stromata globose to elongate, bark brown, $20\text{--}50\mu\text{m}$ in diam. Fascicles dense to very dense. Conidiophores pale olivaceous brown, short, not septate, not geniculate, unthickened, small conidial scar at the conic tip, $10\text{--}35 \times 2\text{--}4\mu\text{m}$. Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, multiseptate, tip subobtuse to conic, base obconically truncate, $15\text{--}65 \times 2\text{--}3.5\mu\text{m}$.

Habitat: On leaves of *Tabernaemontana malacaensis* (Apocynaceae), Tampines, Singapore, leg. Jo-min Yen (No. M.S. 726), Dec. 30, 1965.

Distribution: Burma, India, W. Malaysia, Philippines, Sabah and Singapore.

91. *Pseudocercospora tabernaemontanicola* (Yen) Yen, comb. nov.

= *Cercospora tabernaemontanicola* Yen, Bull. Soc. Mycol. Fr. 84:14, 1968.

Leaf spots circular, brown, with an indefinite yellowish brown border on the upper side, scattered, 2–5mm in diam. Fruiting hypophyllous, visible as minute black pustules on the lower side. Stromata lacking or consisting of few brown cells. Fascicles poor to medium (3–15 stalks), emerging through the stomata. External hyphae hypogenous filling stomatal openings, pale brown, septate, branched, $2.5\text{--}4.5\mu\text{m}$ in width. Conidiophores strictly hypophyllous, either arising from fascicles or arising from external hyphae, simple or branched, erect or flexuous, 0–4 septate, 0–2 geniculate, apex attenuate and truncate, conidial scars inconspicuous, $18\text{--}79 \times 3.5\text{--}5\mu\text{m}$. Conidia cylindrical (rarely obclavato-cylindrical), pale olivaceous brown, curved, straight for the short ones, 3–8 septate, tip rounded or subobtuse, base slightly attenuate and truncate, $50\text{--}130 \times 3\text{--}4.5\mu\text{m}$.

Habitat: On leaves of *Tabernaemontana coronaria* (Apocynaceae), Botanic Gardens, Singapore, leg. Jo-min Yen (No. M.S. 725), Nov. 26, 1965.

Note: *Pseudocercospora tabernaemontanae* (H. & P. Syd.) Deighton is different from this fungus by its "shot-hole" leaf spots and its simple and continuous conidiophores.

92. *Pseudocercospora thunbergicola* (Yen) Deighton (Fig. 61)

Mycol. Papers 140:154, 1976.

= *Cercospora thunbergicola* Yen, Revue de Mycol. 30:1965, 1965.

Leaf spots amphigenous, circular to angular, or irregular, with a whitish centre, surrounded by a dark brown border, scattered, 0.5–3mm in diam. Fruiting amphiphylous, invisible. Stromata rudimentary or small, brown, subglobose, 20–30 μ m in diam. Fascicles meagre to dense (2–22 stalks), emerging through the stomata. External hyphae amphigenous, also emerging through the stomata, pale brown, septate, branched, 2–3 μ m in width. Conidiophores either arising from fascicles or arising from external hyphae, olivaceous brown, paler and narrower towards the apex, generally simple, sometimes branched, erect or tortuous, 0–4 septate, 0–2 geniculate, tip attenuate and truncate, conidial scars inconspicuous, 12–80 x 3.5–5 μ m. Conidia cylindrical or obclavato-cylindrical, pale olivaceous brown, straight or slightly curved, 4–11 septate, tip subacute, base attenuate and truncate, 67–174 x 3.5–5 μ m.

Habitat: On leaves of *Thunbergia alata* (Acanthaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 60), Jun. 20, 1964.

Note: *Cercospora thunbergiae* Boel. is different from this fungus by its hypogenous fruiting and continuous and non-septate conidiophores.

93. *Pseudocercospora timorensis* (Cooke) Deighton (Fig. 50)

Mycol. Papers 140:154, 1976.

= *Cercospora timorensis* Cooke, Grevillea 12:38, 1883.

Syn. *Cercospora batatae* Zimm., Ber. Land. — Forstw. Deutsch. Ostaf. 2:28, 1904.

Cercospora batatae P. Henn., Bot. Jahrb. von Engler 38:118, 1907.

Leaf spots circular to irregular, at first yellowish brown with an indefinite border, later becoming grayish in the centre, scattered, 6–10mm in diam. Fruiting amphigenous, but mostly hypophyllous, invisible. Stromata lacking, or very rudimentary. Fascicles poor to medium (3–12 stalks), emerging through the stomata. Conidiophores pale olivaceous brown, always simple, cylindrical, erect or slightly flexuous, continuous, sometimes 1–2 septate, tip attenuate and truncate, 14–50 x 3–5 μ m. Conidia cylindrical, pale olivaceous brown, slightly curved, 3–7 septate, tip rounded, base very slightly attenuate and truncate, 40–103 x 3.5–4.5 μ m.

Habitat: On leaves of *Ipomoea batatas* (Convolvulaceae), Bukit Timah, Singapore, leg. G. Lim, Apr. 25, 1969..

Distribution: Africa, China, Ecuador, Japan, Panama, Philippines and Singapore.

94. *Pseudocercospora trematicola* (Yen) Deighton (Fig. 62)

Mycol. Papers 140:154, 1976.

= *Cercospora trematicola* Yen, Bull. Soc. Mycol. Fr. 86:752, 1970b.

Leaf spots distinct on the lower side, but indistinct on the upper side, gray, angular, very small, strictly vein-limited, scattered, 0.2–1mm in diam., often coalescing and forming gray large patches. Fruiting strictly hypophyllous, visible as gray velvet under hand lens. Stromata lacking. Fascicles occasionally present, Very poor (2–6 stalks), emerging through the stomata. External hyphae hypophyllous, emerging through the stomata, pale olivaceous brown, septate, branched, 2.5–3.5 μ m in width. Conidiophores either arising from fascicles or from external hyphae, simple or branched, erect or flexuous, not geniculate, 0–5 septate, tip attenuate and truncate, 12–57.5 x 3.5–7 μ m. Conidia obclavato-cylindrical, but cylindrical for the short ones, pale olivaceous brown, straight or slightly curved, 2–10 septate, tip rounded, base obconically truncate, 36–96 x 4–5 μ m.

Habitat: On leaves of *Trema orientalis* (Urticaceae), Jurong, Singapore, leg. Jo-min Yen (No. M.S. 727), Dec. 17, 1965.

95. *Pseudocercospora trematis-cannabini* (Yen & Lim) Deighton (Fig. 63).

Mycol. Papers 140:154, 1976.

= *Cercospora trematis-cannabini* ('tremae-canabinae') Yen & Lim, Bull. Soc. Mycol. Fr. 86:749, 1970b.

Leaf spots amphigenous, circular to irregularly circular, pale brown, with an indefinite border, scattered, 0.5–5mm in diam., sometimes confluent. Fruiting strictly epiphyllous, visible as minute black hairs under hand lens. Stromata dark brown, globose, 18–30 μ m in diam. Fascicles medium to dense, emerging through the stomata. Conidiophores olivaceous brown, paler toward the apex, simple, never branched, filamentous, 2–14 septate, 0–2 geniculate, tip rounded or occasionally truncate, 45–170 x 3–4 μ m. Conidia obclavato-cylindrical or cylindrical, pale olivaceous brown, usually curved, 5–12 septate, tip rounded or subobtuse, base shortly attenuate and truncate, 50–115 x 3–4 μ m.

Habitat: On leaves of *Trema cannabina* (Urticaceae), Johor Baru, Malaysia, leg. G. Lim, Nov. 28, 1969.

Note: This fungus differs from others by its strictly epigenous fruiting and long filamentous conidiophores.

96. *Pseudocercospora ubicola* (Yen) Deighton (Fig. 64).

Mycol. Papers 140:155, 1976.

Leaf spots amphigenous, irregular, brown, at first small and vein-limited, then confluent and forming large patches with an indefinite border. Fruiting strictly hypogenous, invisible. Stromata lacking. Fascicles poor to medium (2–15 stalks) emerging through the stomata. External hyphae hypophyllous, also emerging through the stomata, 2–5 in fascicles, pale, olivaceous brown, septate, branched, 1.2–2.5 μ m in width. Conidiophores either arising from fascicles or from external hyphae, generally simple, erect or tortuous, 0–3 septate, 0–2

geniculate, sometimes with constrictions at septa, pale olivaceous brown, tip attenuate and truncate, $6-30 \times 3.5-5\mu\text{m}$. Conidia very thin, acicular or filiform, subhyaline, straight or slightly curved, 3-8 septate, tip conic, base slightly obconic truncate, $56-101 \times 2-2.5\mu\text{m}$.

Habitat: On leaves of *Dioscorea* sp. (Dioscoreaceae), Botanic Gardens, Singapore, leg. Mrs. Shu-hsien Yen (No. 54), Jun. 7, 1964.

97. *Pseudocercospora viticicola* (Yen & Lim) Yen, comb. nov. (Fig. 65).

= *Cercospora viticicola* Yen & Lim, Cahiers du Pacifique 17:104, 1973.

Leaf spots irregularly circular to irregularly angular, grayish brown, with an indefinite black brown border, scattered, 1-4mm in diam., distinct on the upper side, but strictly indistinct on the lower side, sometimes confluent. Fruiting amphiphylous, visible as black minute pustules under hand lens. Stromata epigenous, forming within the epidermal cell, black brown, globose, $24-44\mu\text{m}$ in diam. Fascicles dense to very dense, emerging through rupture of epidermal cells. External hyphae strictly hypophyllous, emerging through the stomata, pale olivaceous brown, septate, branched, $2-3\mu\text{m}$ in width. Conidiophores may be divided into two kinds: A, conidiophores arising from fascicles, always epigenous, pale olivaceous brown, simple, never branched, continuous or one septate, erect or slightly tortuous, apex irregularly rounded or slightly attenuate and truncate, $8-35 \times 2-4.5\mu\text{m}$; B, conidiophores arising from external hyphae, always hypogenous, pale olivaceous brown, simple, erect, continuous, tip attenuate and truncate, $2-15 \times 2-3.5\mu\text{m}$. Conidia obclavato-cylindrical or obclavate, pale olivaceous brown midly curved, 3-7 septate, tip subobtuse, base obconically truncate, $33-70 \times 2.5-3.5\mu\text{m}$.

Habitat: On leaves of *Vitex pubescens* and *V. trifolia* (Verbenaceae), Singapore, leg. G. Lim (No. S.U. 75), Mar. 3, 1972.

Note: *Cercospora weberi* Chupp differs from this species by its epigenous fruiting and strictly epiphylous external hyphae.

98. *Stenella fagraeae* Yen

Revue de Mycol. 32:200, 1967a.

Leaf spots amphigenous, very distinct, circular, pale brown but heavily coloured in the centre, later forming "Frog eyes", with fine concentric lines in the centre and surrounded by a raised and thick border, cattered, 1-3mm in diam. Fruiting amphiphylous, appearing as minute black pustules under hand lens. Stromata generally small, sometimes well developed, globose or irregularly globose, dark brown to nearly black, $40-90\mu\text{m}$ in diam. Fascicles medium to dense (2-20 stalks), emerging through the stomata or through the rupture of the epidermis. External hyphae emerging through the stomata, pale brown to brown, septate, branched, $3.5-4.5\mu\text{m}$ in diam. Conidiophores amphiphylous, either arising from fascicles or arising from external hyphae, always simple, cylindrical, straight, pale brown to brown, 0-1 septate, not geniculate, with a finely granulated membrane, tip rounded or irregularly truncate, 1-2 brown conidial scars at the apex, $28-43 \times 3.5-4.5\mu\text{m}$. Conidia cylindrical or obclavato-cylindrical, pale brown, straight or slightly curved, with a finely granulated membrane, 1-5 septate, tip rounded, base obconically truncate, $26-48 \times 3.5-4.2\mu\text{m}$.

Habitat: On leaves of *Fagraea fragrans* (Loganiaceae), Bukit Timah, Singapore, leg. Chih-shao Lee (No. 13), Aug. 20, 1965.

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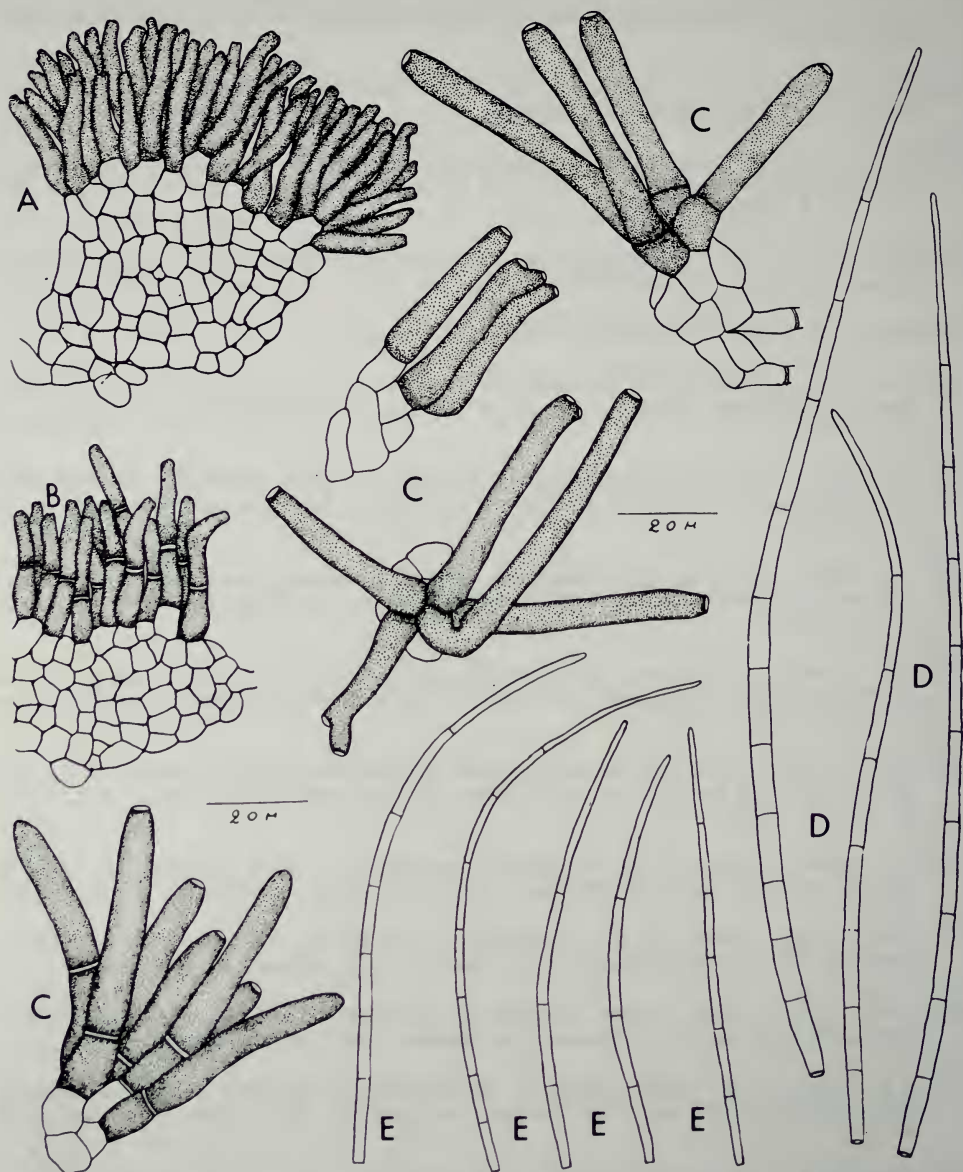


Fig. 1. *Cercoseptoria balsaminicola* (Yen & Lim) Yen (A, B & E): A, stromata and fascicle of young conidiophores; B, old conidiophores; E, conidia. *Cercospora balsaminiana* Yen & Lim (C & D): C, fascicle of conidiophores; D, conidia.

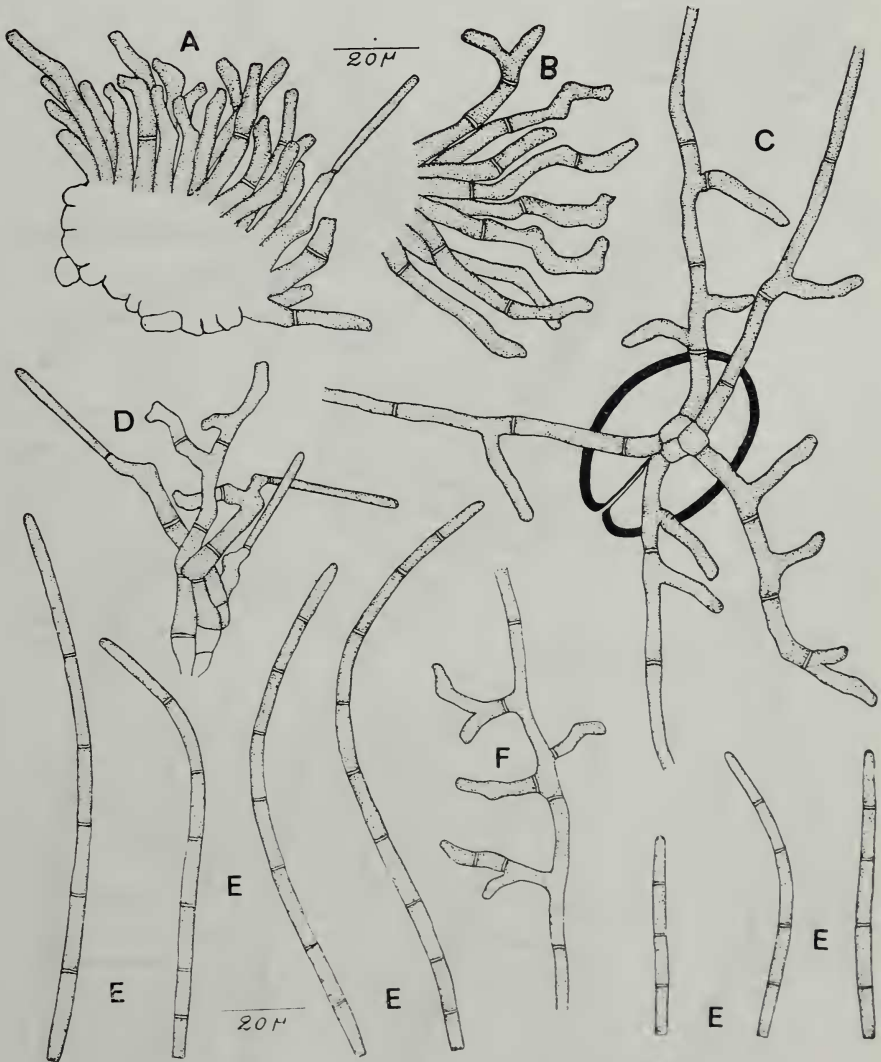


Fig. 2. *Cercoseptoria ixoriana* (Yen & Lim) Yen: A, fascicle of young conidiophores; B & D, old conidiophores; C & F, external hyphae and unbranched conidiophores; E, conidia.

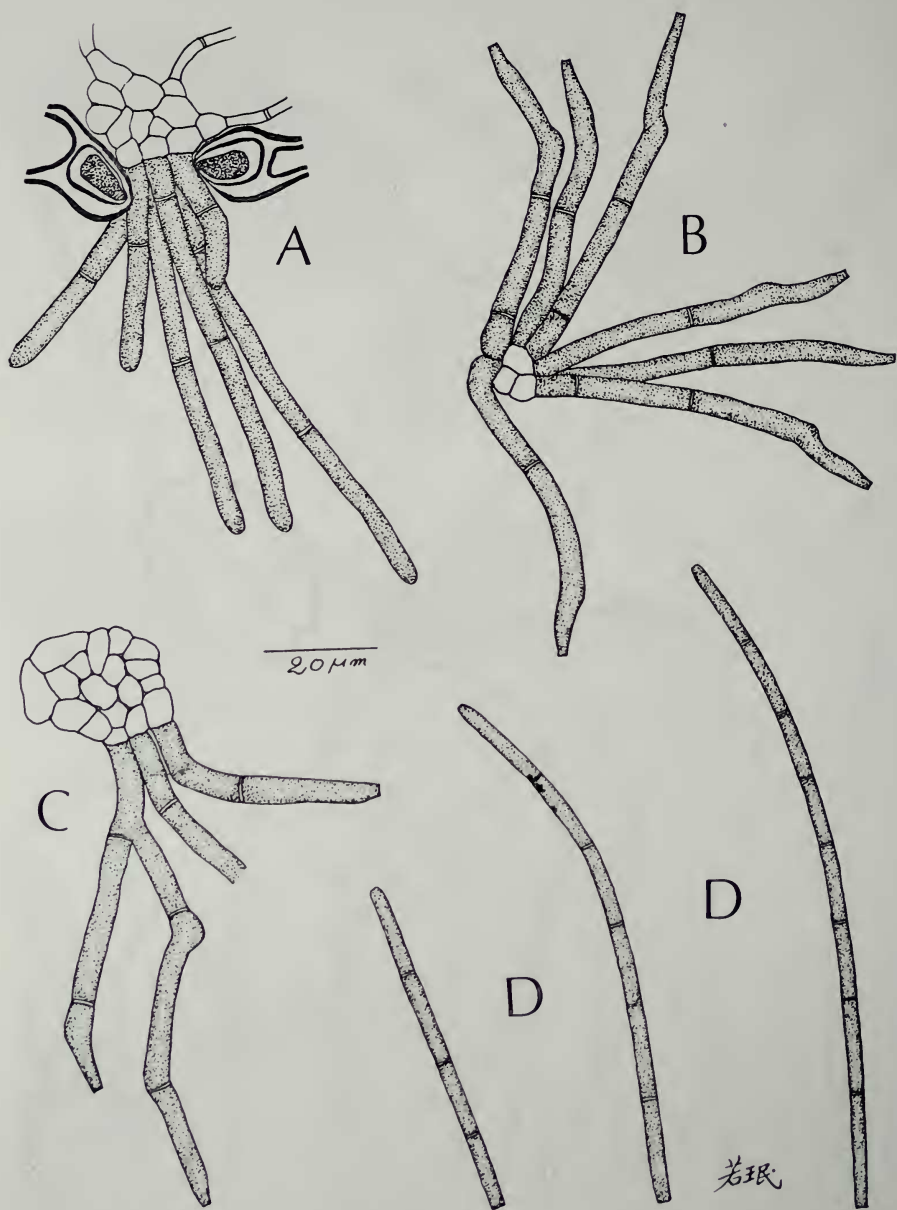


Fig. 3. *Cercoseptoria polygonigena* (Yen) Yen: A, fascicle of young conidiophores; B & C, fascicles of old conidiophores; D, conidia.

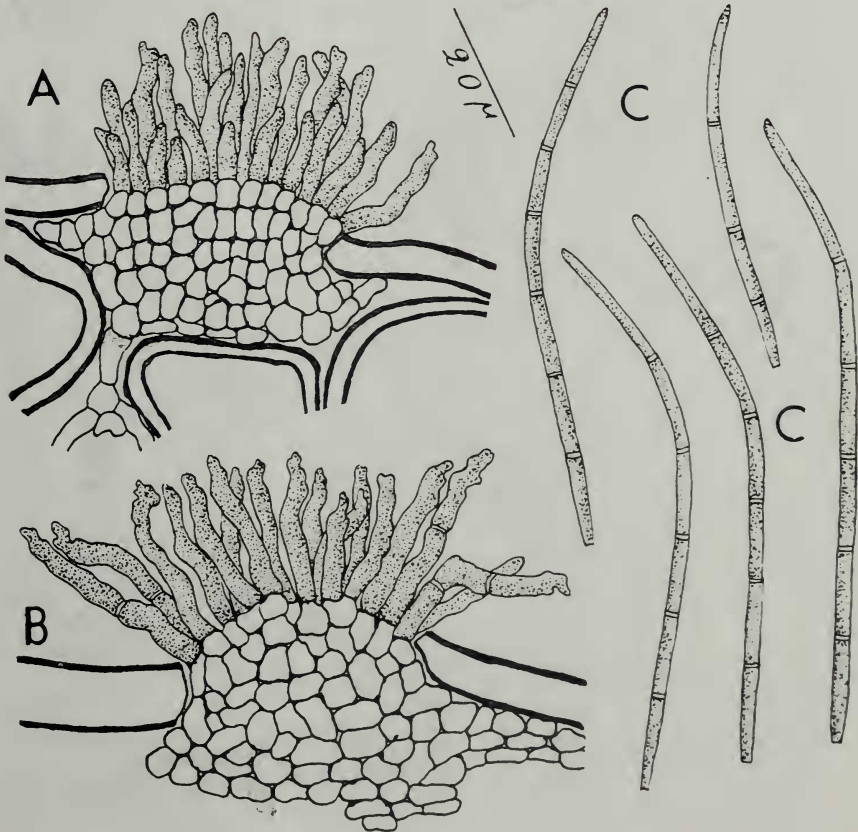


Fig. 4. *Cercoseptoria rhododendricola* (Yen) Deighton: A & B, fascicles of conidiophores and stromata; C, conidia.



Fig. 5. *Cercoseptoria tecomae-heterophyllae* (Yen) Yen: A, B & C, fascicles of conidiophores and stromata; D, E & G, external hyphae and unbranched conidiophores; F, conidia.

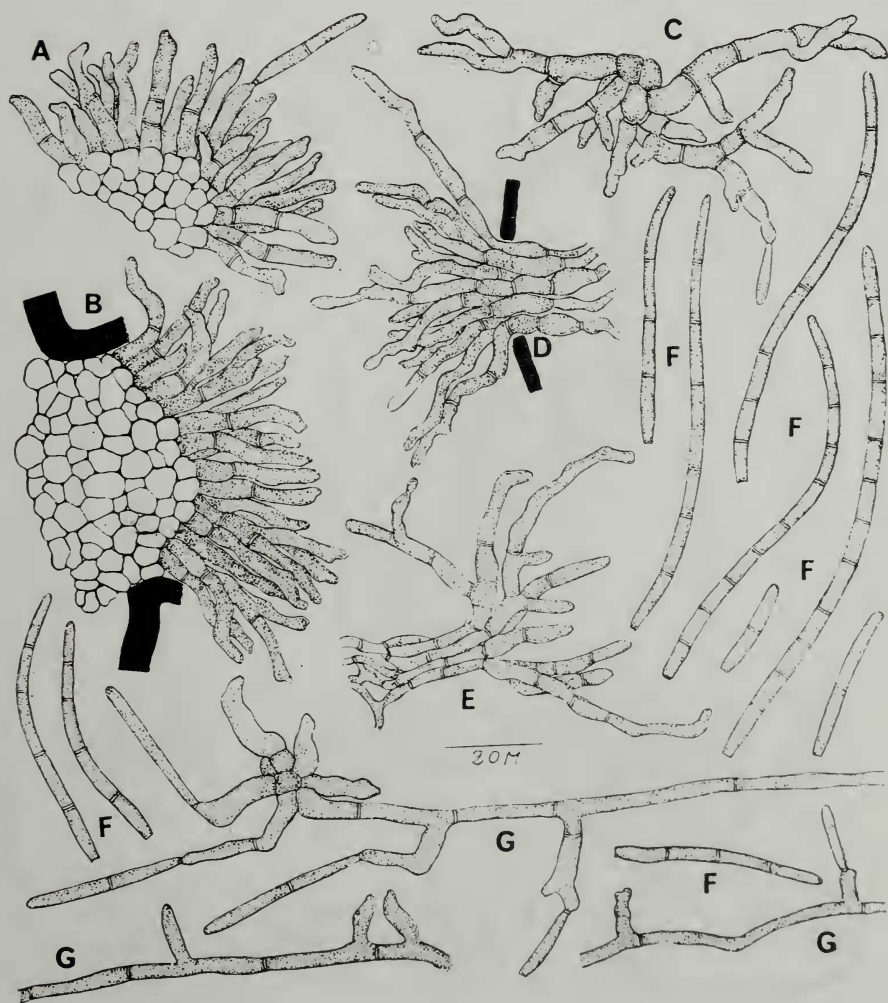


Fig. 6. *Cercoseptoria tecomicola* (Yen) Yen: A & B, fascicles of young conidiophores and stromata; C, D & E, fascicles of old conidiophores without stromata; F, conidia, G, external hyphae and unbranched conidiophores.



Fig. 7. *Cercospora abacopteridis* Yen & Lim (C-E): C, fascicle of conidiophores; D, germination of conidia; E, conidia. *Pseudocercospora abacopteridicola* (Yen & Lim) Yen (A & B): A, conidia; B, external hyphae and conidiophores.

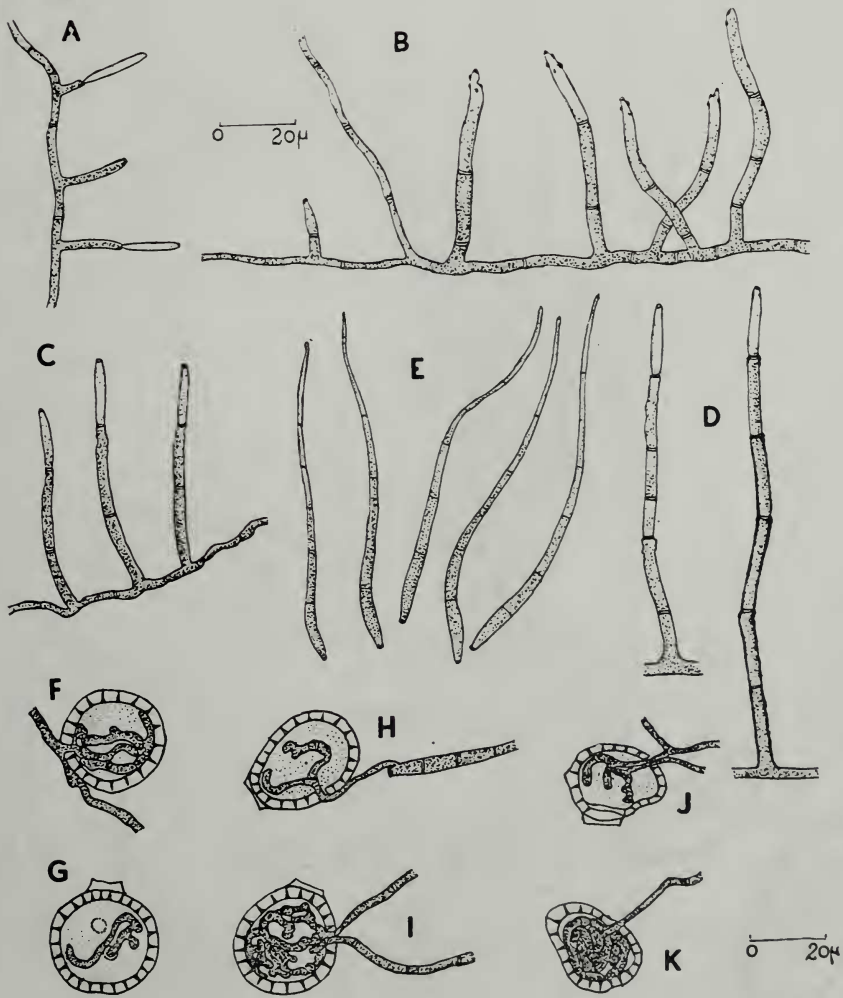


Fig. 8. *Cercospora acori* Yen: A, B & C, young conidiophores; D, old conidiophores; E, conidia; F-K, penetration by *Cercospora* hyphae via the germinative pore of uredospores.

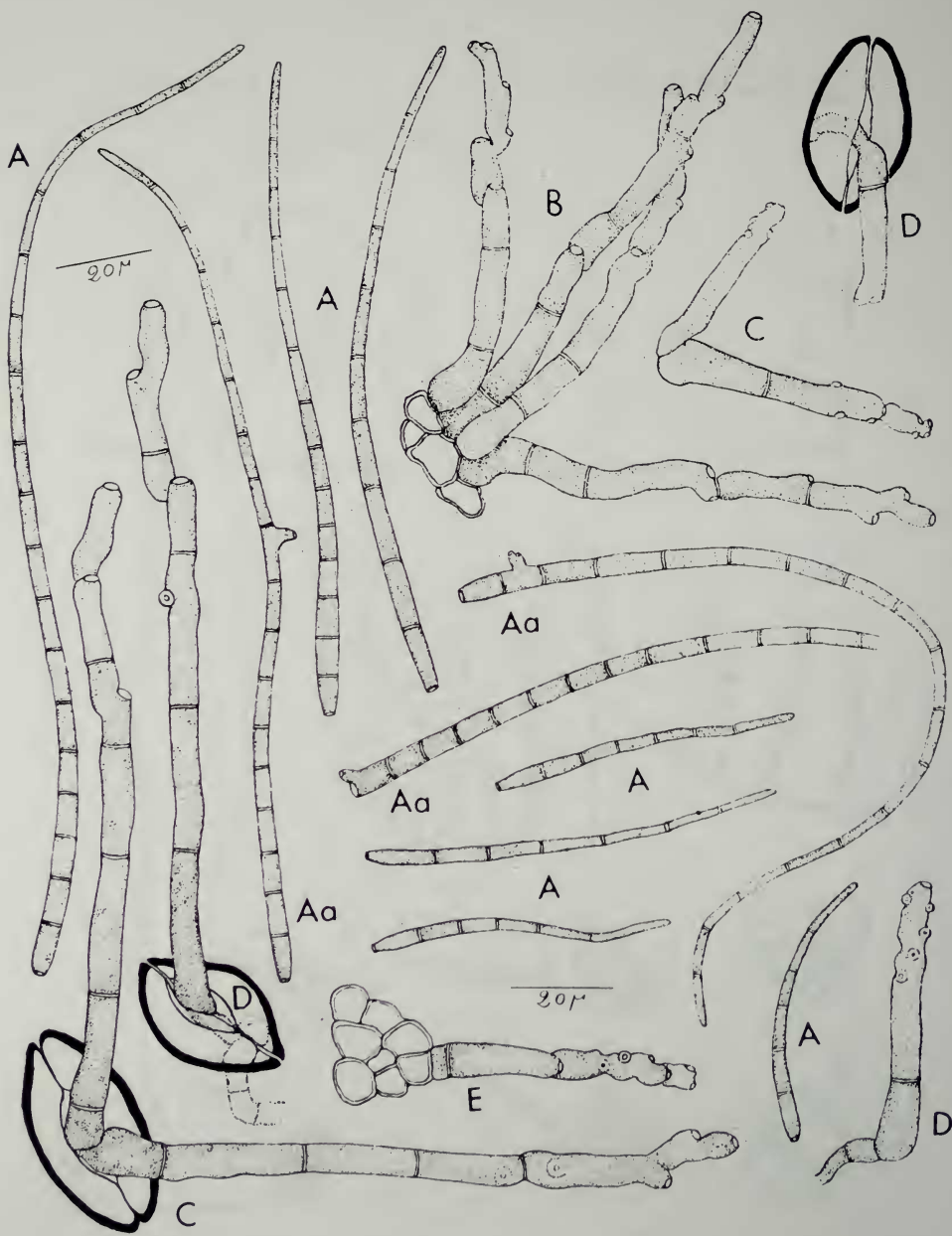


Fig. 9. *Cercospora asystasiana* Yen: A, conidia; Aa, germination of conidia; B & C, fascicles of conidiophores; D, single conidiophore; E, rudimentary stromata.

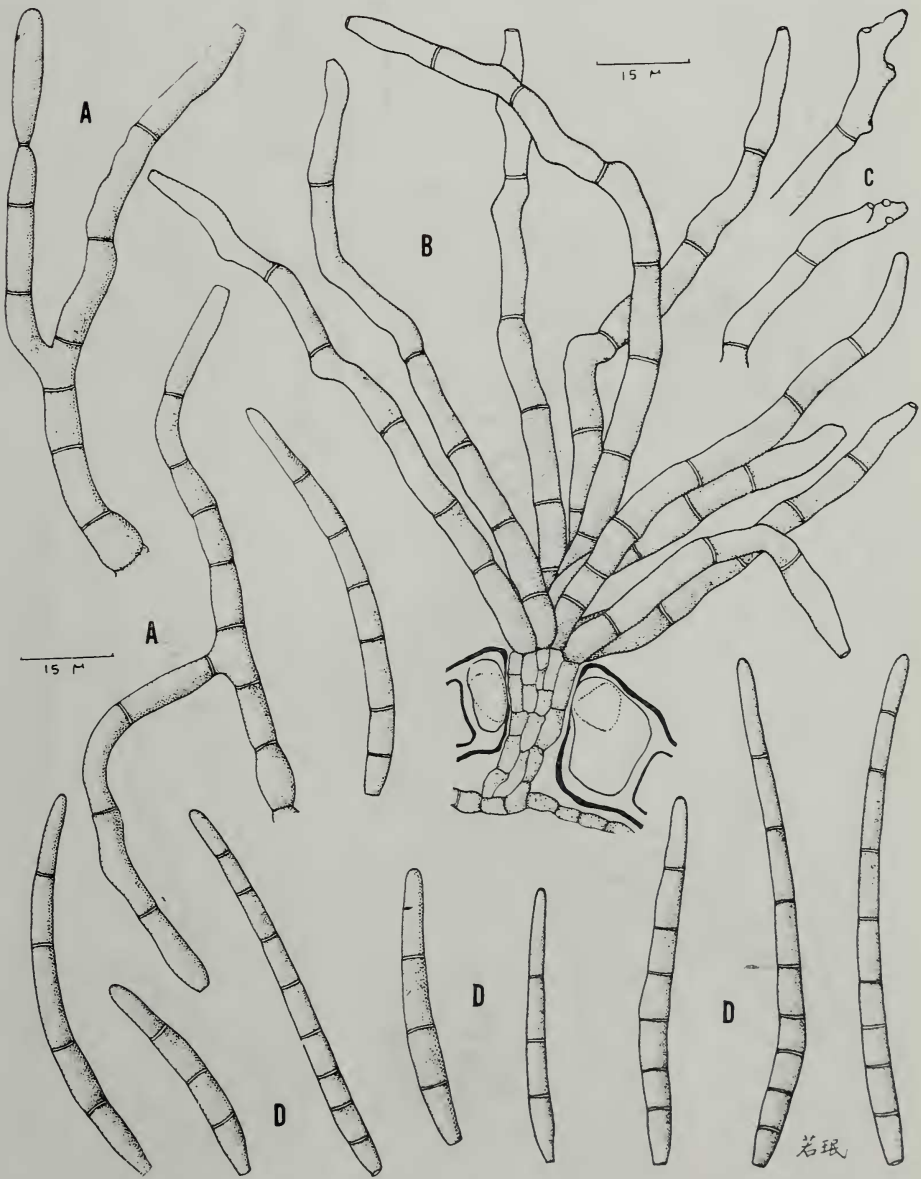


Fig. 10. *Cercospora barleriae* Yen & Lim: A, branched conidiophores; B, fascicle of conidiophores; C, ends of conidiophores; D, conidia.

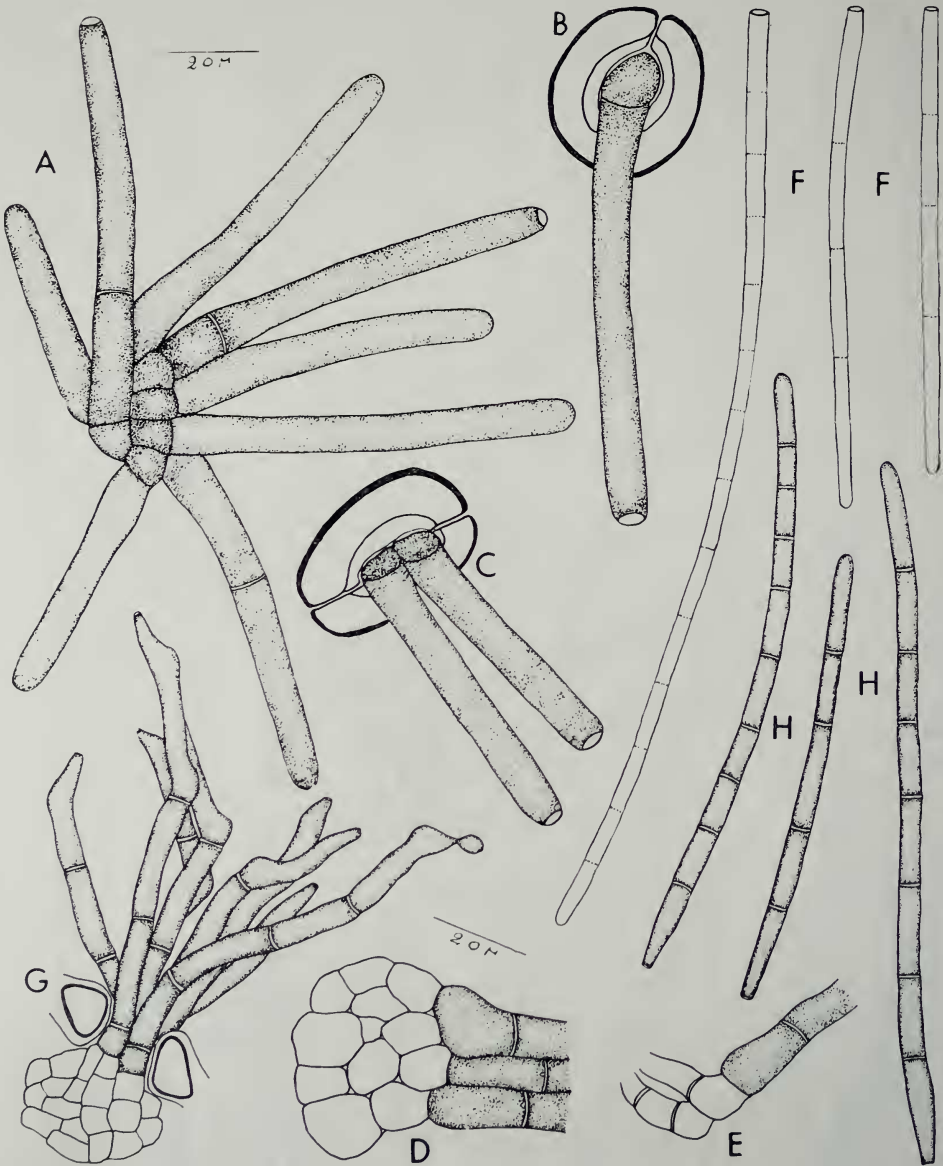


Fig. 11. *Cercospora canavaliiana* Yen & Lim (A-F): A & C, fascicles of conidiophores; B, unbranched conidiophore; D & E, rudimentary stromata; F, conidia. *Pseudocercospora cruenta* (Sacc.) Deighton (G & H): G, stromata and conidiophores; H, conidia.

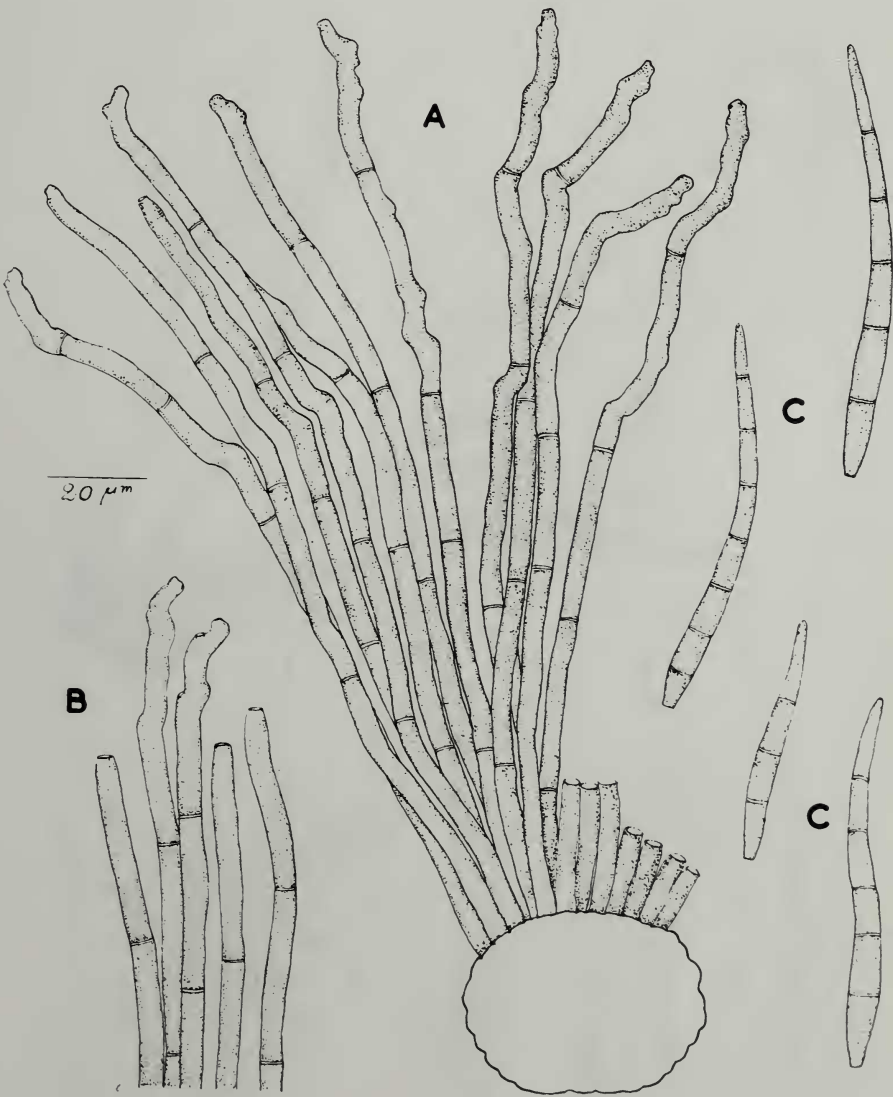


Fig. 12. *Cercospora cassiae-nodosae* Yen: A, fascicle of conidiophores; B, ends of conidiophores; C, conidia.

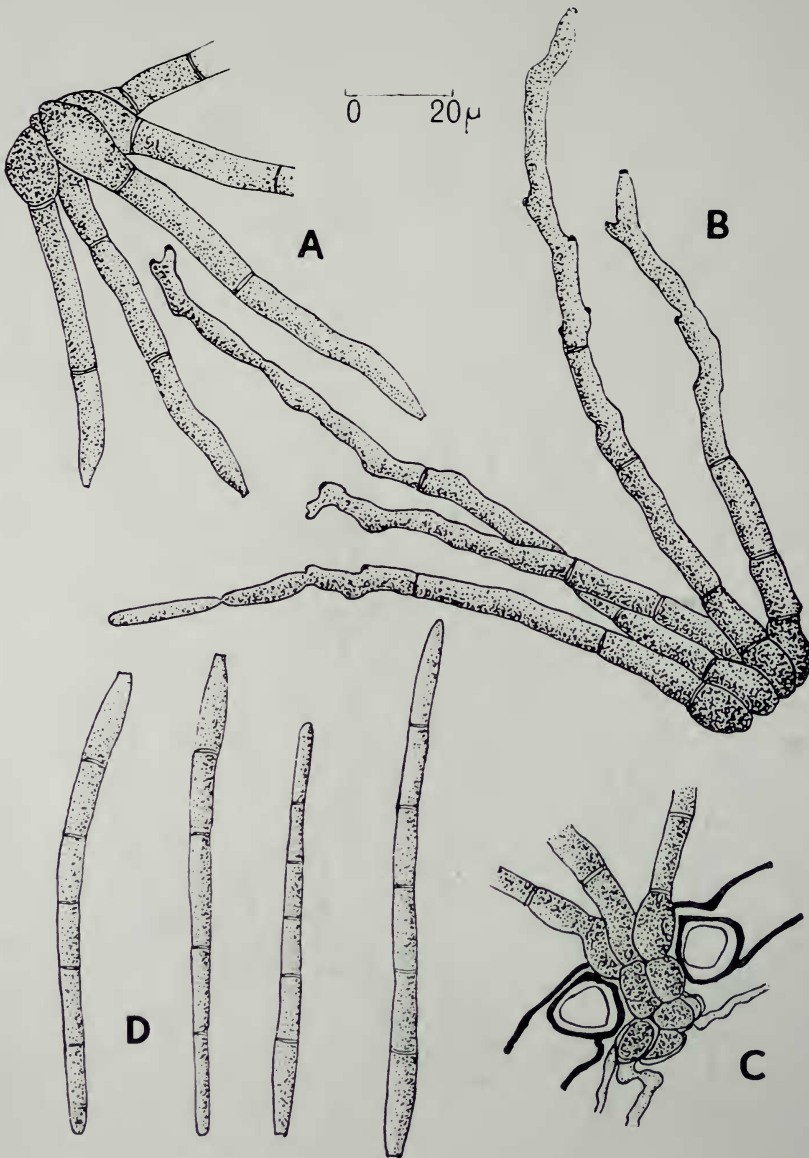


Fig. 13. *Cercospora cassiae-occidentalis* Yen: A, fascicle of young conidiophores; B, fascicle of old conidiophores; C, rudimentary stromata; D, conidia.

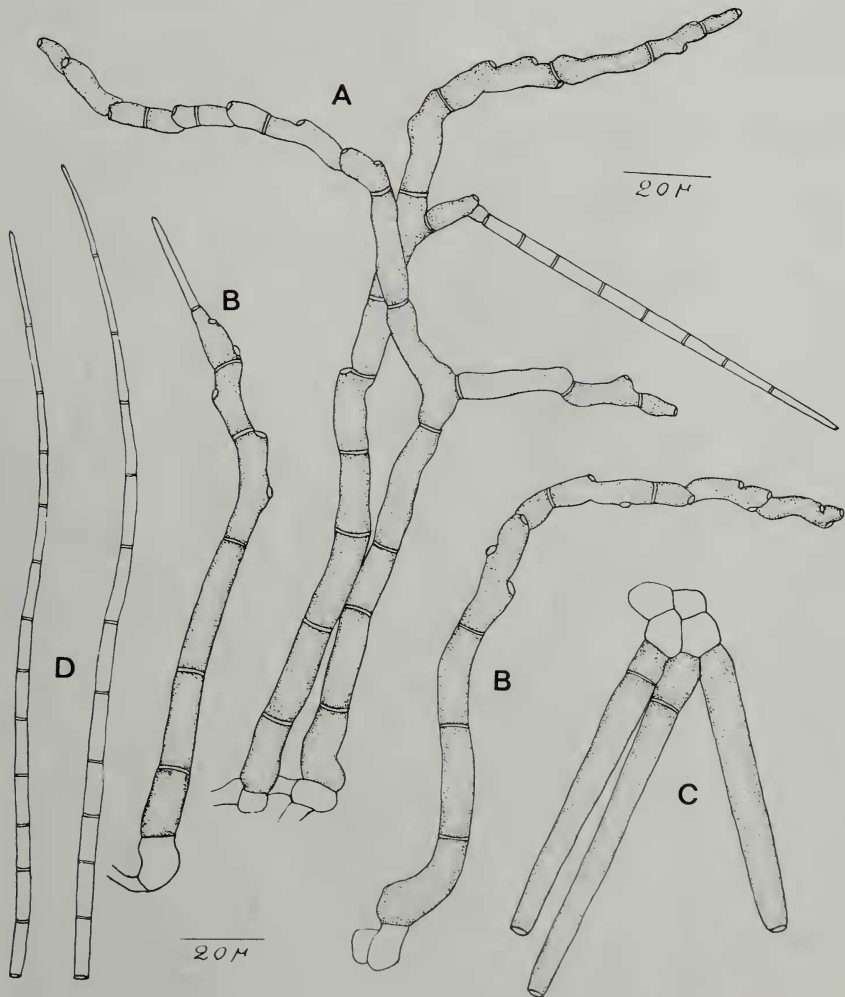


Fig. 14. *Cercospora coleiana* Yen & Lim: A, fascicle of old conidiophores; B, unbranched conidiophores; C, fascicle of young conidiophores; D, conidia.

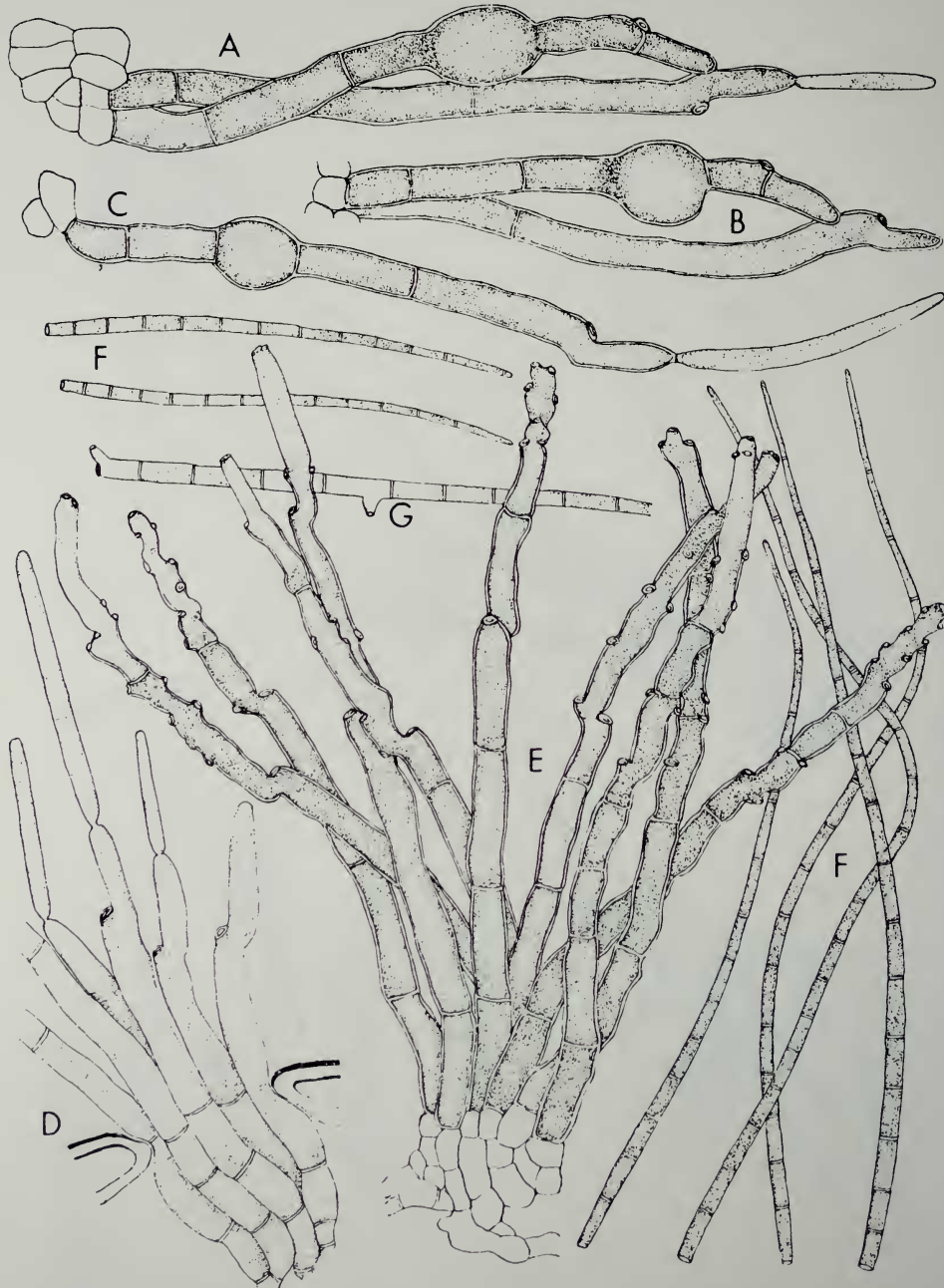


Fig. 15. *Cercospora dioscoreae-pyrifoliae* Yen: A, B & C, conidiophores with abnormal globular swellings; D, fascicle of young conidiophores; E, fascicle of old conidiophores; F, conidia.

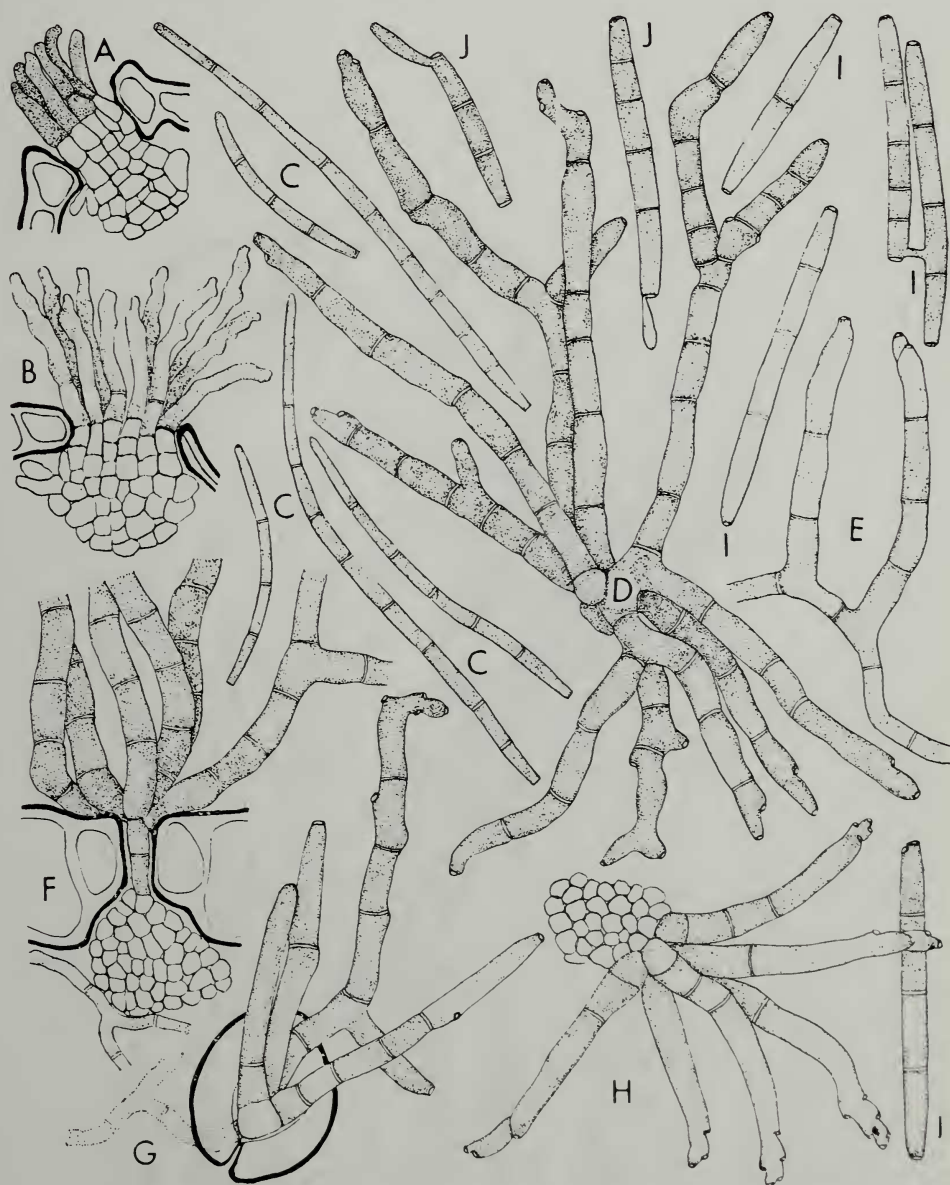


Fig. 16. *Cercospora eupatorii-odorati* Yen (D-J): D & F, fascicles of old conidiophores and stromata; E, external hyphae and unbranched conidiophores; G, fascicle without stromata; H, fascicle of young conidiophores; I, conidia; J, germination of conidia. *Pseudocercospora eupatorii-formosani* (Saw.) Yen (A-C): A, fascicle of young conidiophores; B, fascicle of old conidiophores; C, conidia.

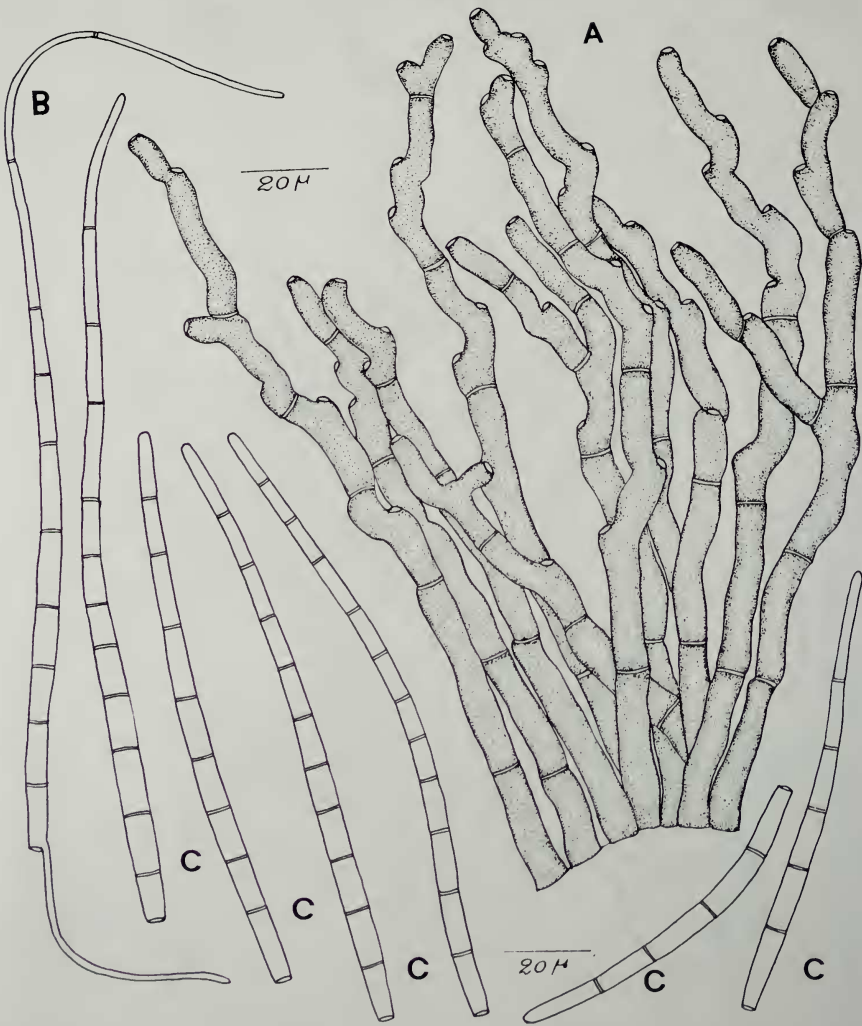


Fig. 17. *Cercospora gloriosicola* Yen & Lim: A, fascicle of conidiophores; B, germination of conidia; C, conidia.

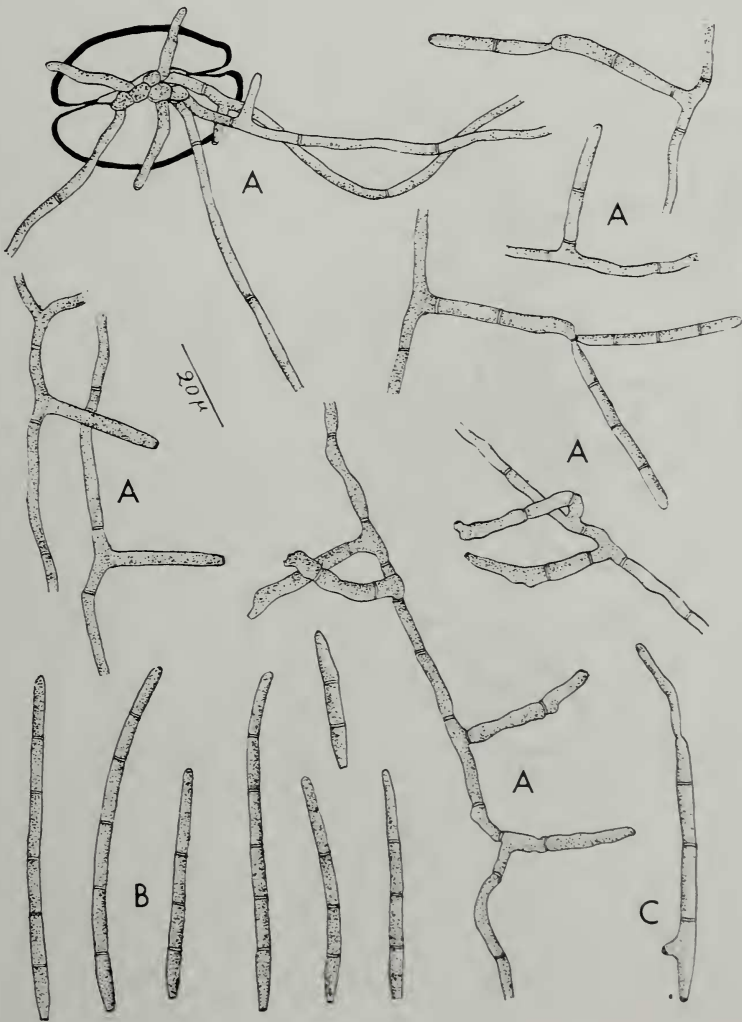


Fig. 18. *Cercospora holobrunnea* Yen: A, external hyphae and unbranched conidiophores; B, conidia; C, germination of conidia.

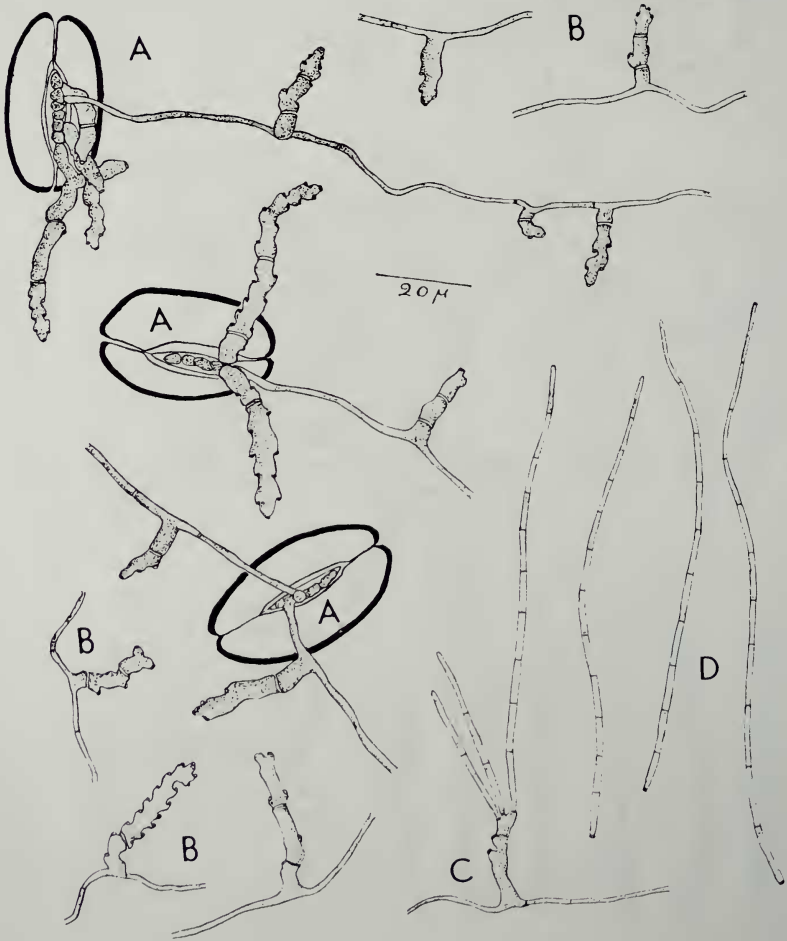


Fig. 19. *Cercospora hyalofilispora* Yen: A & B, external hyphae and unbranched conidiophores; C, formation of conidia; D, conidia.

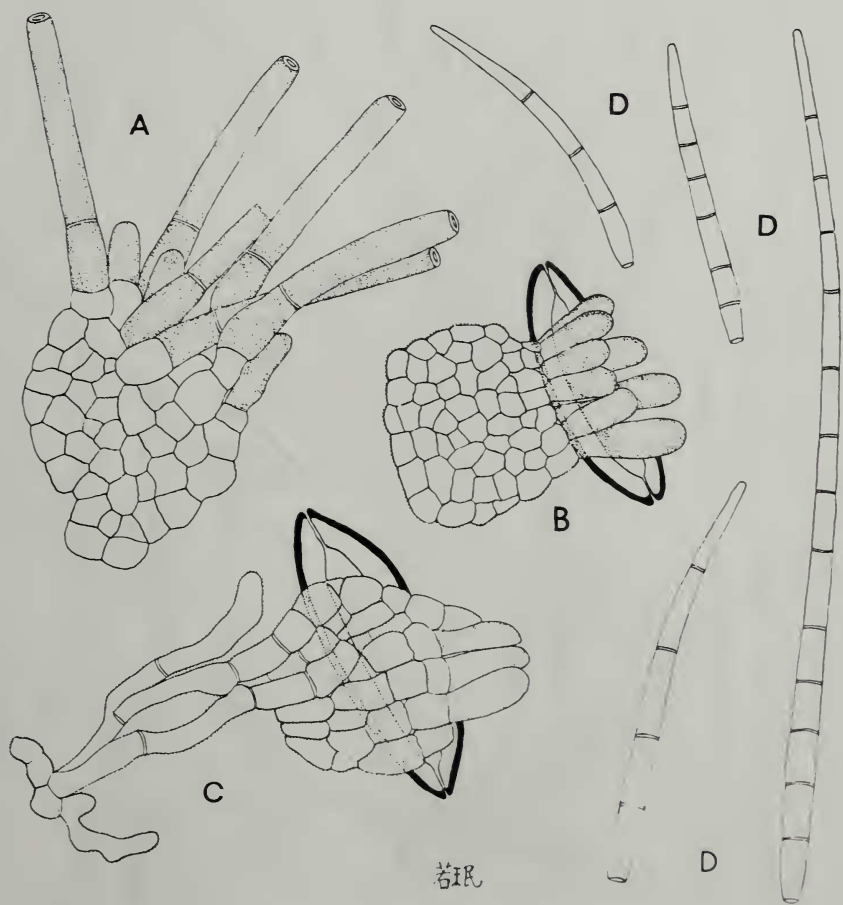


Fig. 20. *Cercospora ipomoeae-pes-caprae* Yen & Lim: A, fascicle of old conidiophores; B & C, fascicle of young conidiophores; D, conidia.

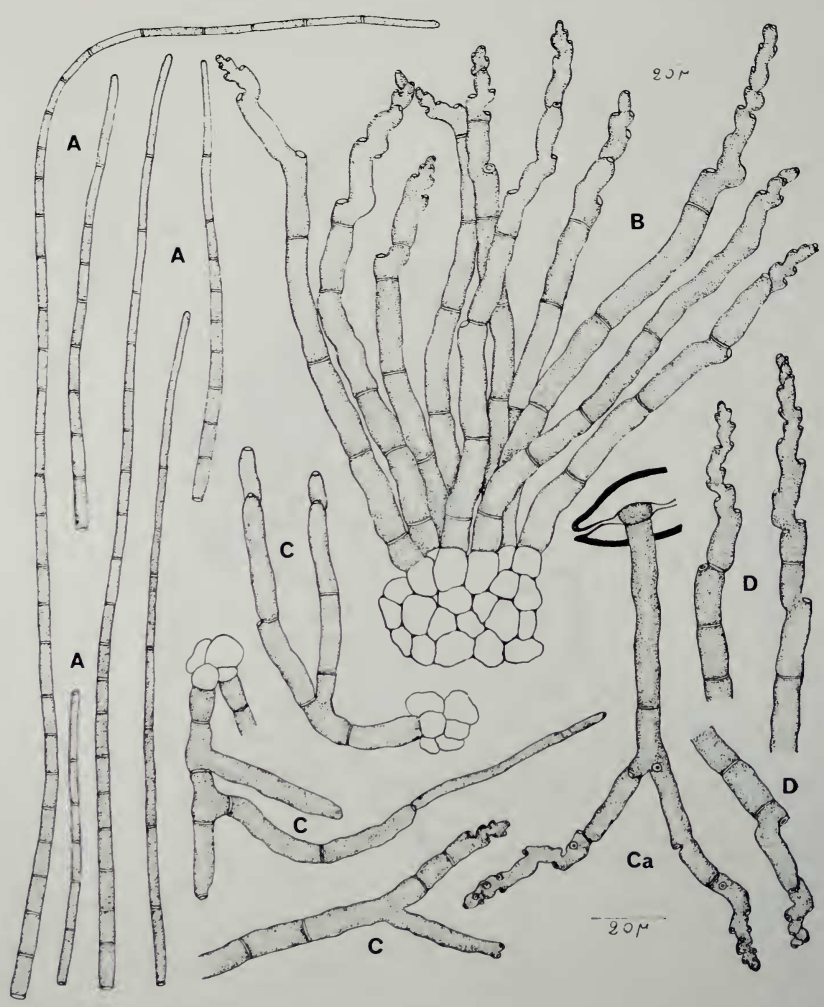


Fig. 21. *Cercospora nicotianicola* Yen: A, conidia; B, fascicle of old conidiophores and stromata; C & Ca, branched conidiophores; D, nodes of conidiophores.

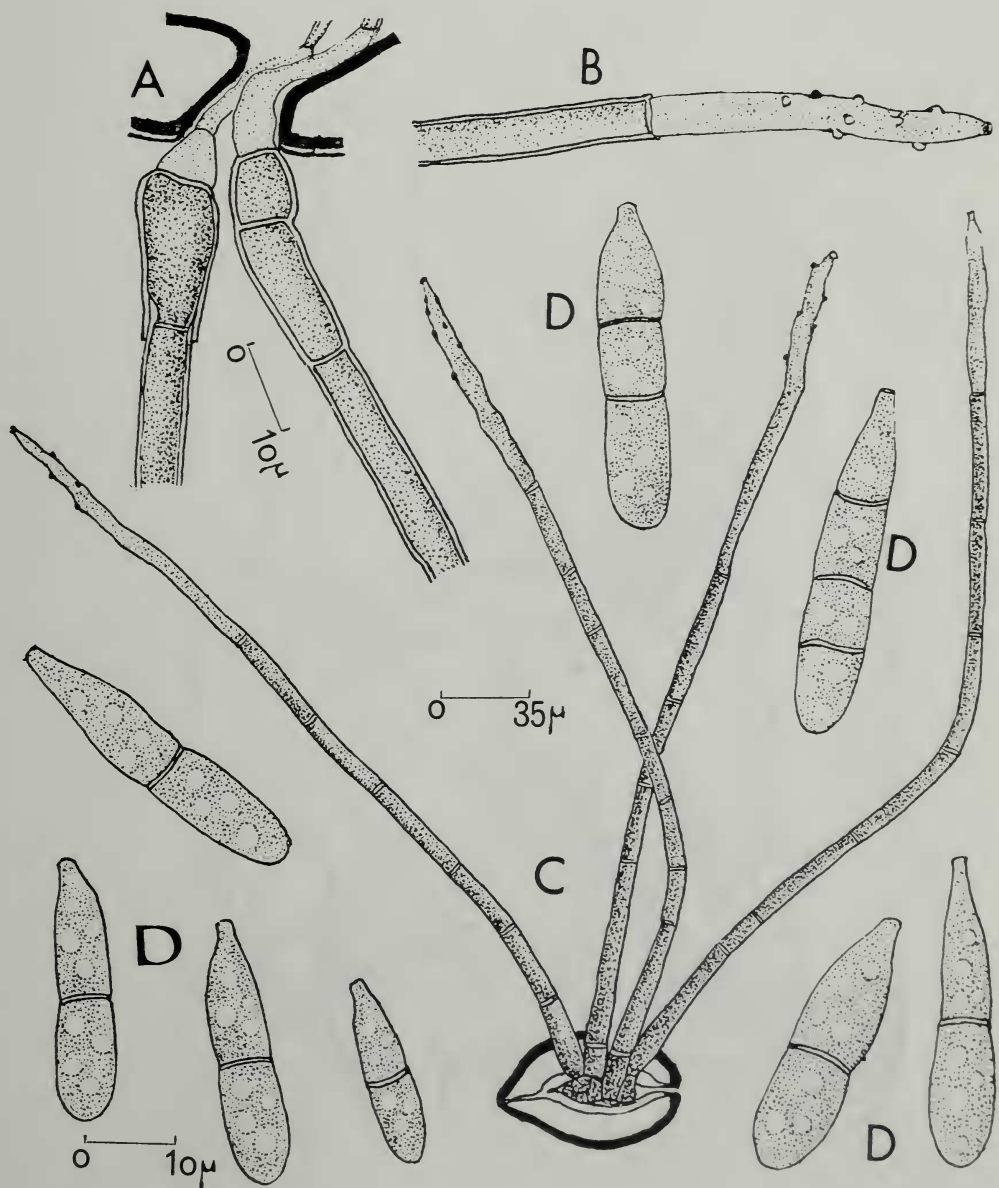


Fig. 22. *Cercospora peristrophes-acuminatae* Yen: A & C, fascicles of conidiophores; B, tip of conidiophore; D, conidia.

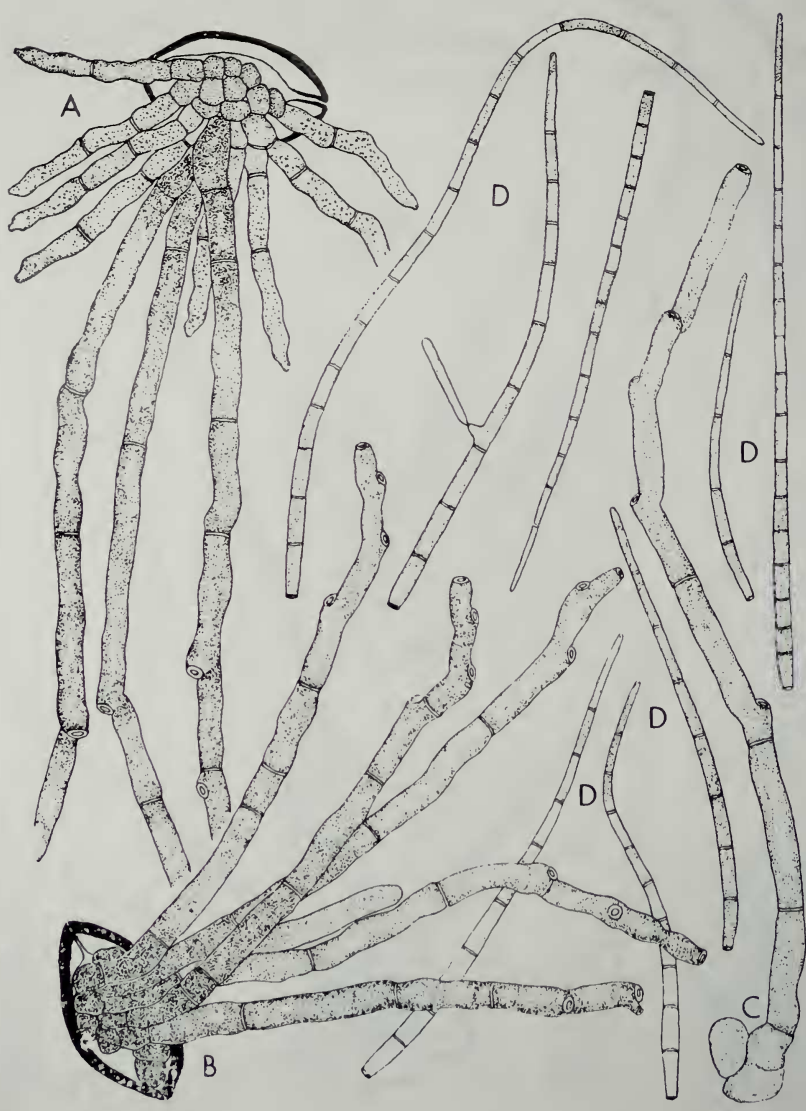


Fig. 23. *Cercospora psophocarpicola* Yen: A & B, fascicles of conidiophores; C, old single conidiophore; D, conidia.

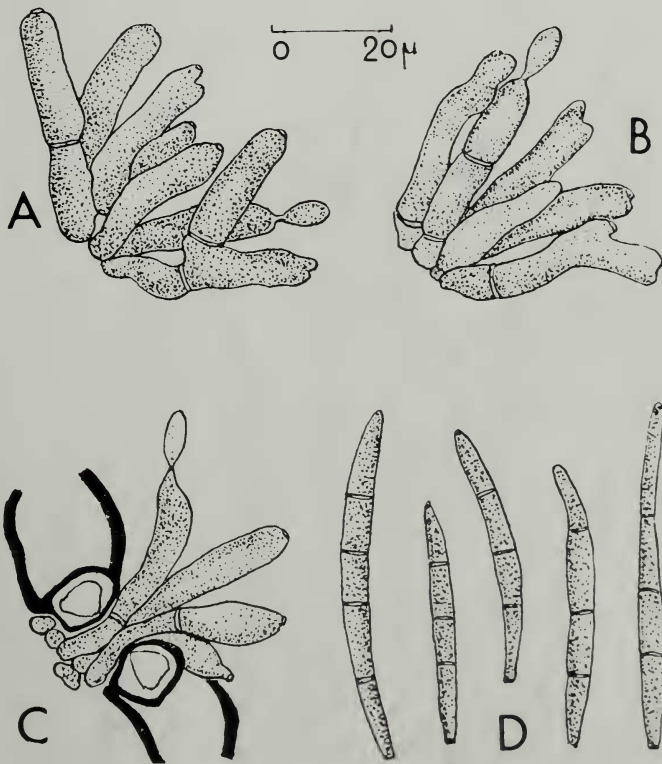


Fig. 24. *Cercospora pudicae* Yen: A-C, fascicles of conidiophores; D, conidia.

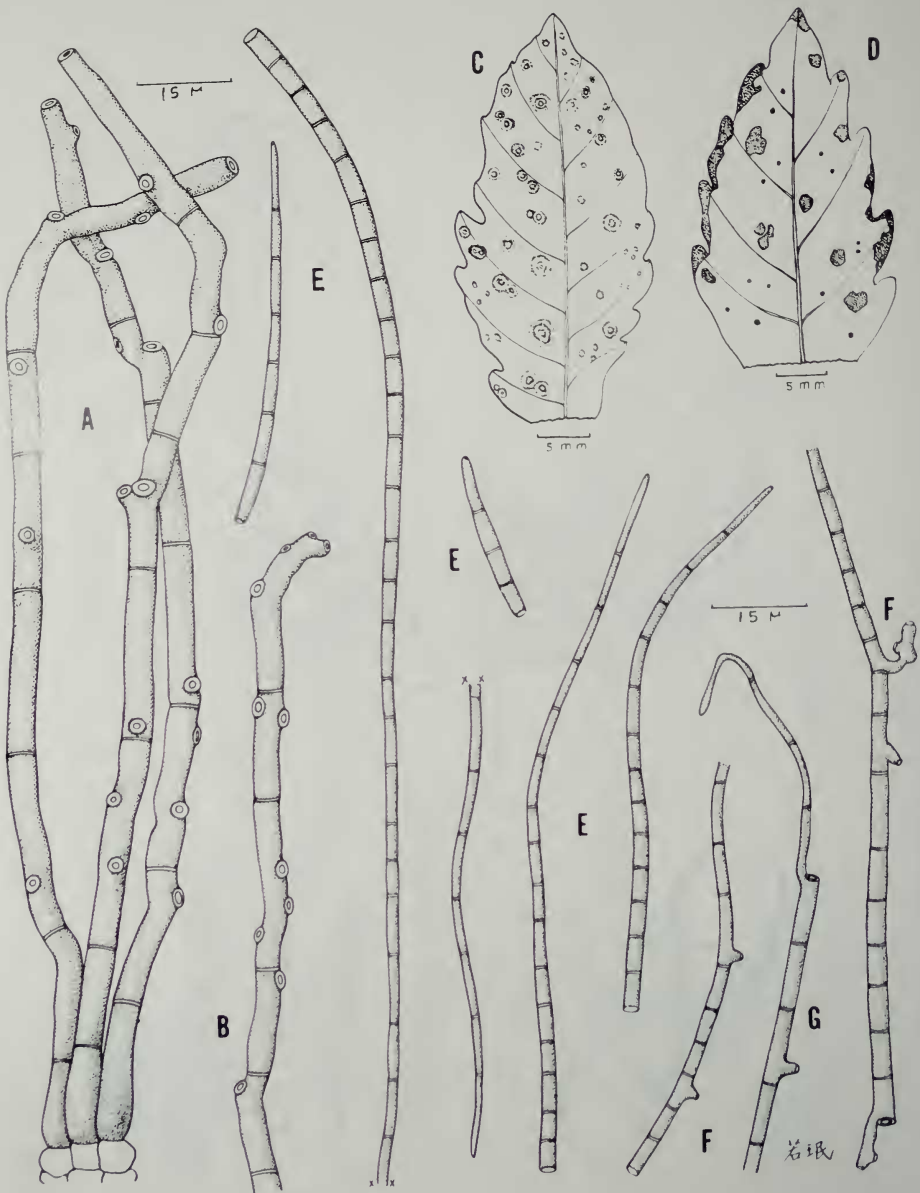


Fig. 25. *Cercospora sesamigena* Yen & Lim: A, fascicle of conidiophores; B, tip of old conidiophore; D, leaf spots; E, conidia; F & G, germination de conidia; C, leaf spots of *Cercospora sesami* Zimm.

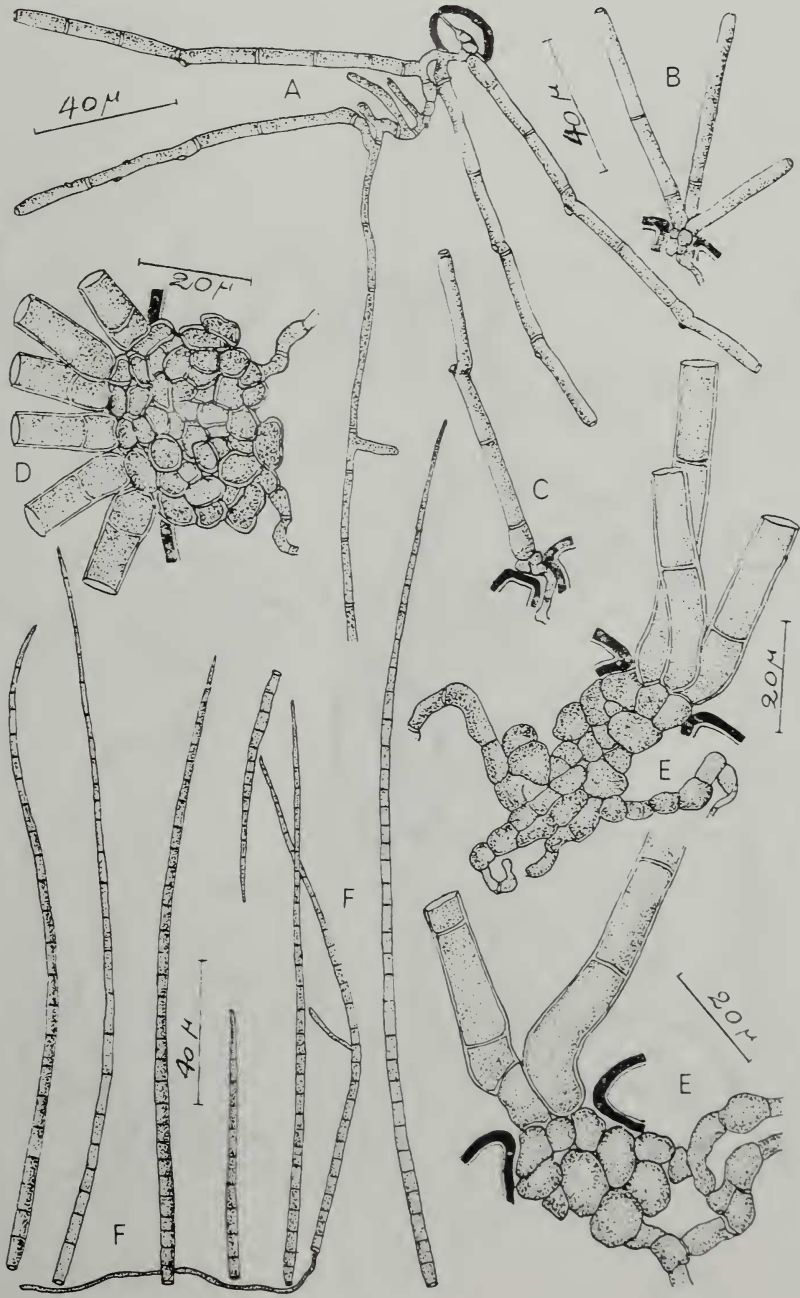


Fig. 26. *Cercospora thunbergiana* Yen: A-C, fascicles of conidiophores; D & E, formation of stromata; F, conidia.

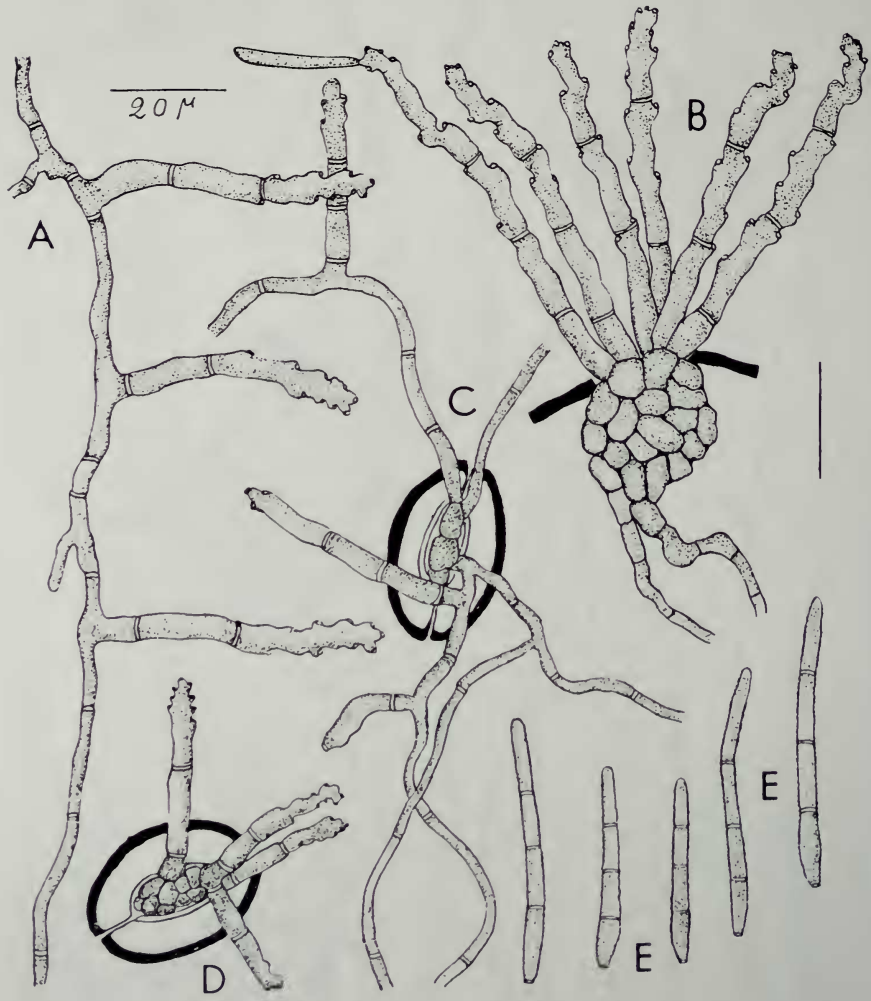


Fig. 27. *Cercospora triseptospora* Yen: A & C, external hyphae and unbranched conidiophores; B & D, fascicles of conidiophores and stromata; E, conidia.

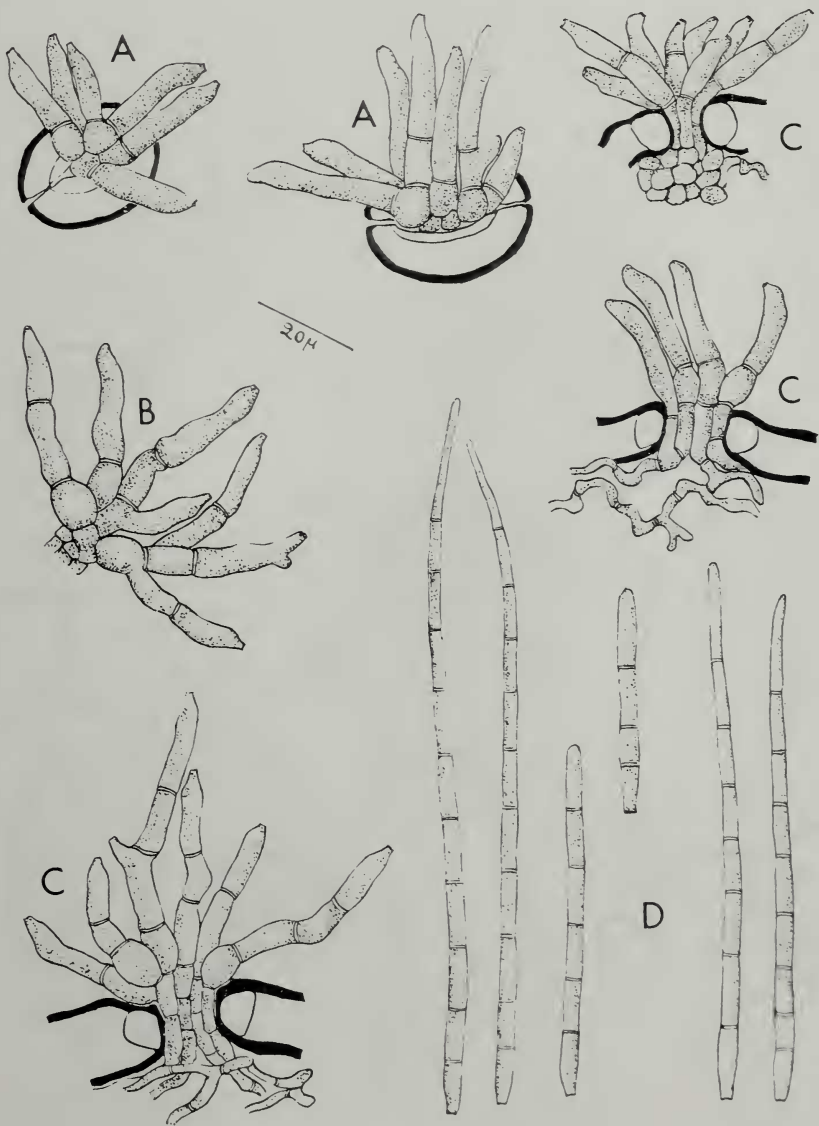


Fig. 28. *Pseudocercospora acalyphigena* (Yen) Yen: A, young conidiophores; B, old and branched conidiophores; C, rudimentary stromata; D, conidia.

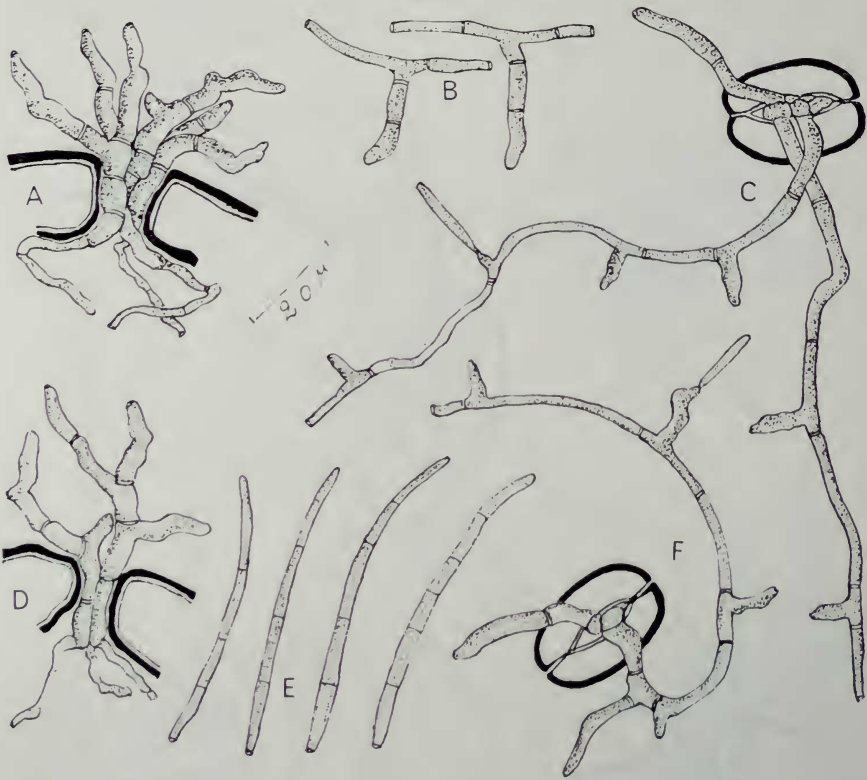


Fig. 29. *Pseudocercospora allamendae* (Yen) Yen: A, fascicle of conidiophores; B, C & F, external hyphae and unbranched conidiophores; D, branched conidiophores; E, conidia.

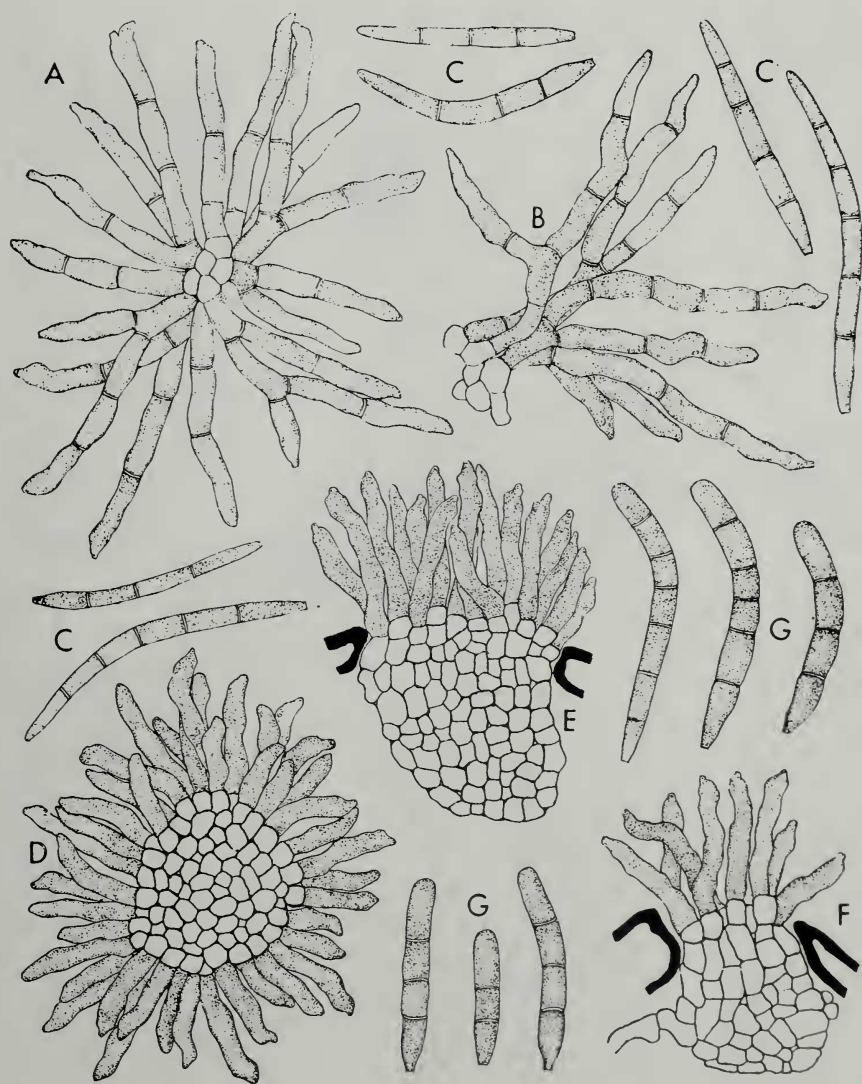


Fig. 30. *Pseudocercospora arametiae* (Borl. & Rold) Yen (A-C): A & B, fascicles of conidiophores; C, conidia. *Pseudocercospora psophocarpi* (Yen) Deighton (D-G): D-F, fascicles of conidiophores and stromata; G, conidia.

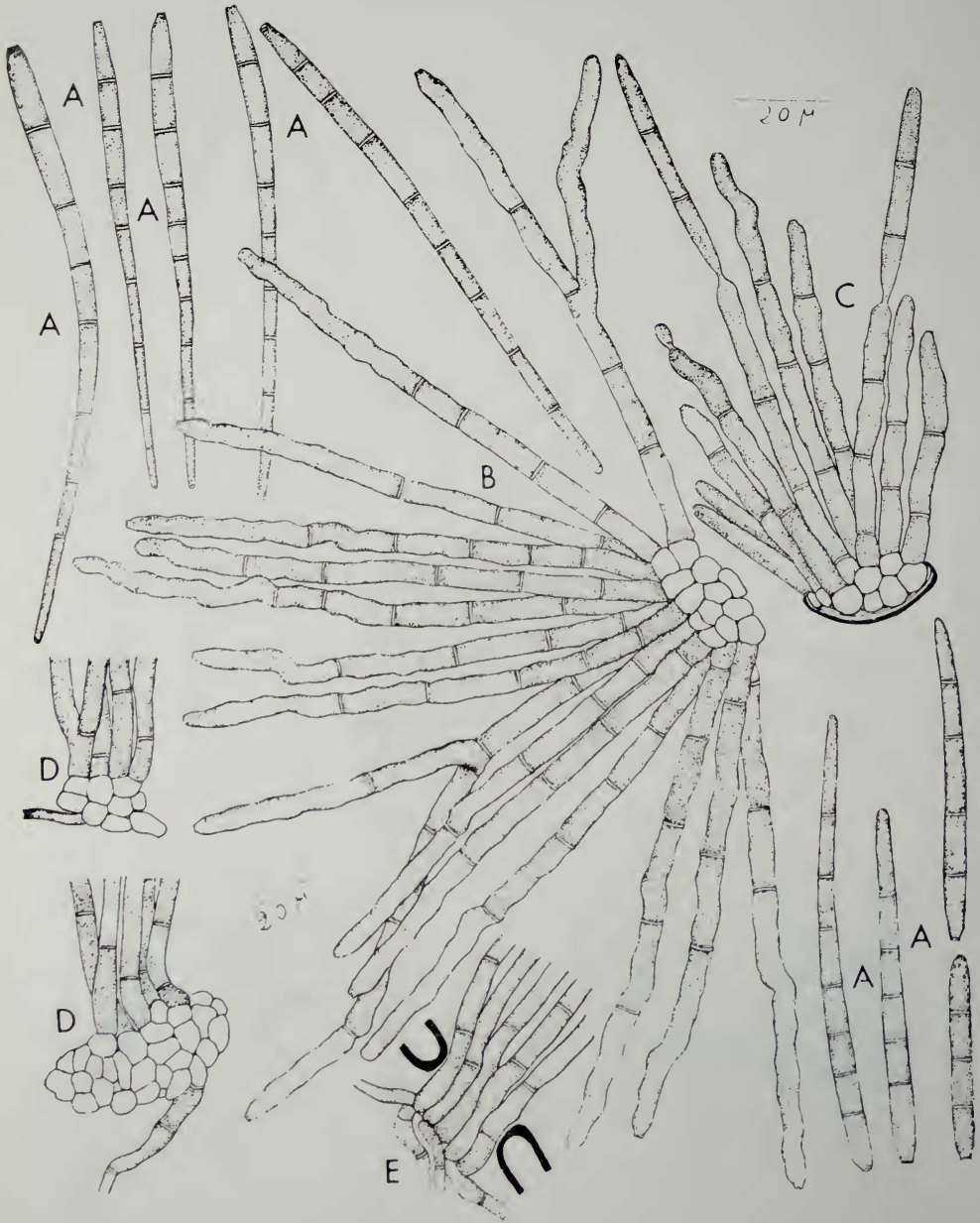


Fig. 31. *Pseudocercospora asystasiae* (Yen) Yen: A, conidia; B, fascicle of old conidiophores; C, fascicle of young conidiophores; D, stromata; E, absence of stromata.

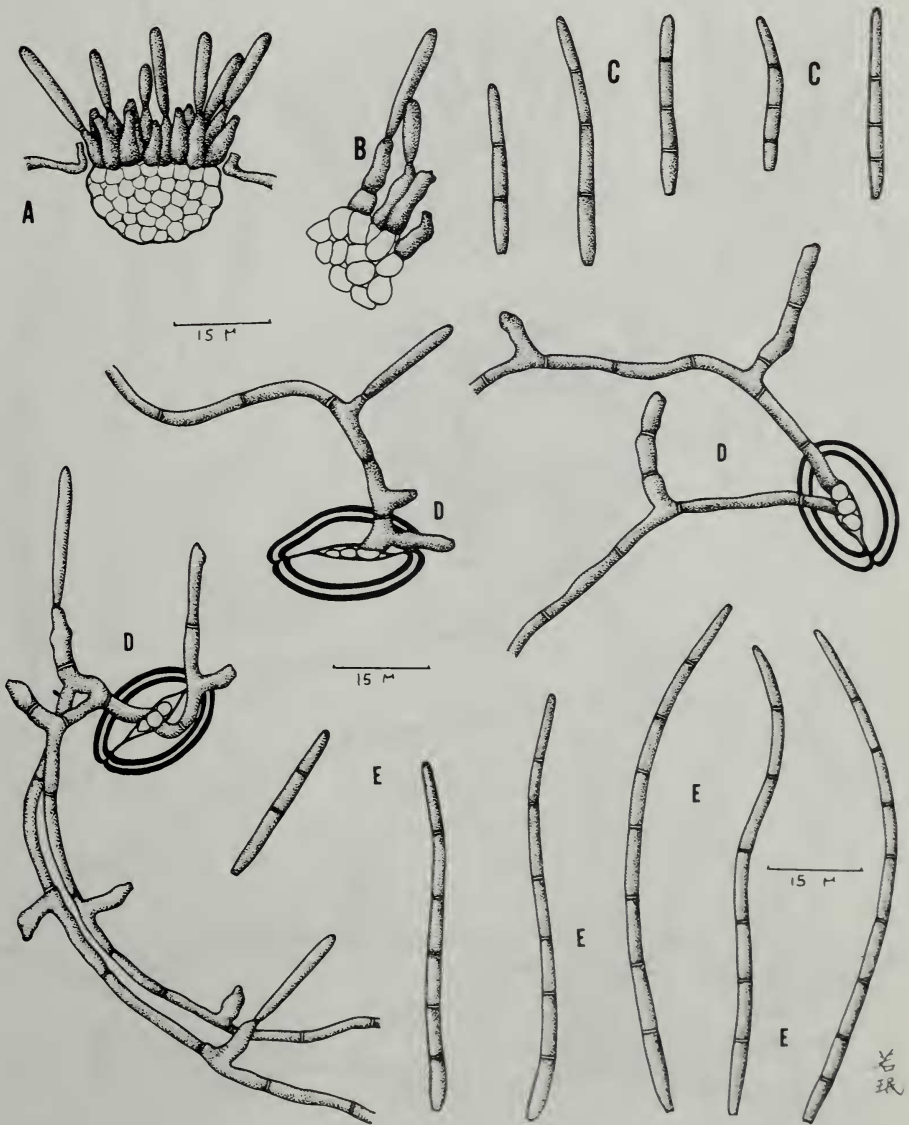


Fig. 32. *Pseudocercospora cassiae-alatae* (Yen & Lim) Yen (D & E): D, external hyphae and unbranched conidiophores; E, conidia. *Pseudocercospora cassigena* (Yen & Lim) Yen (A-C): A, fascicle of young conidiophores; B, old conidiophores; C, conidia.

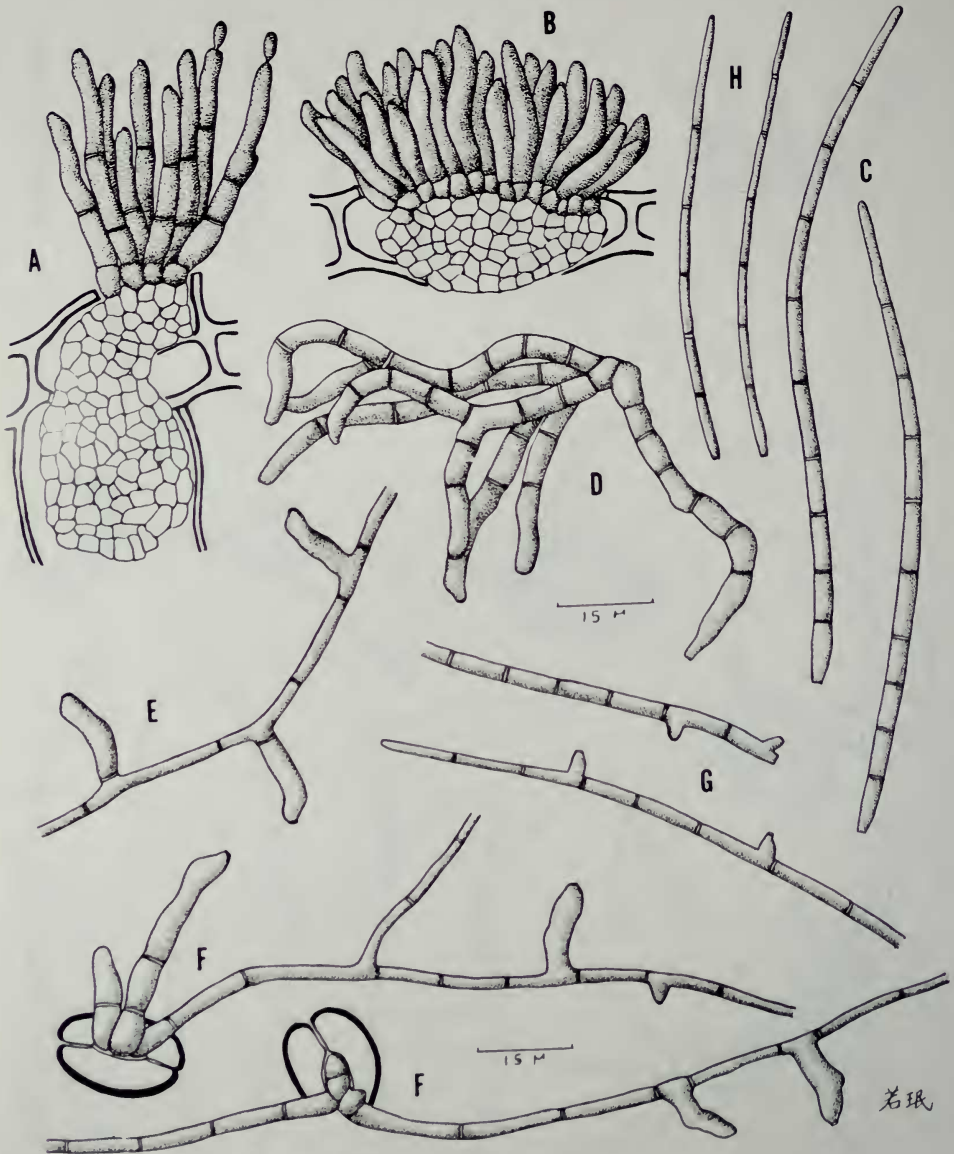


Fig. 33. *Pseudocercospora centrosematicola* (Yen & Lim) Yen: A, fascicle of old conidiophores and stromata; B, fascicle of young conidiophores and stromata; C, conidia. D, branched conidiophores; E & F, external hyphae and single conidiophores; G, germination of conidia; H, secondary conidia.

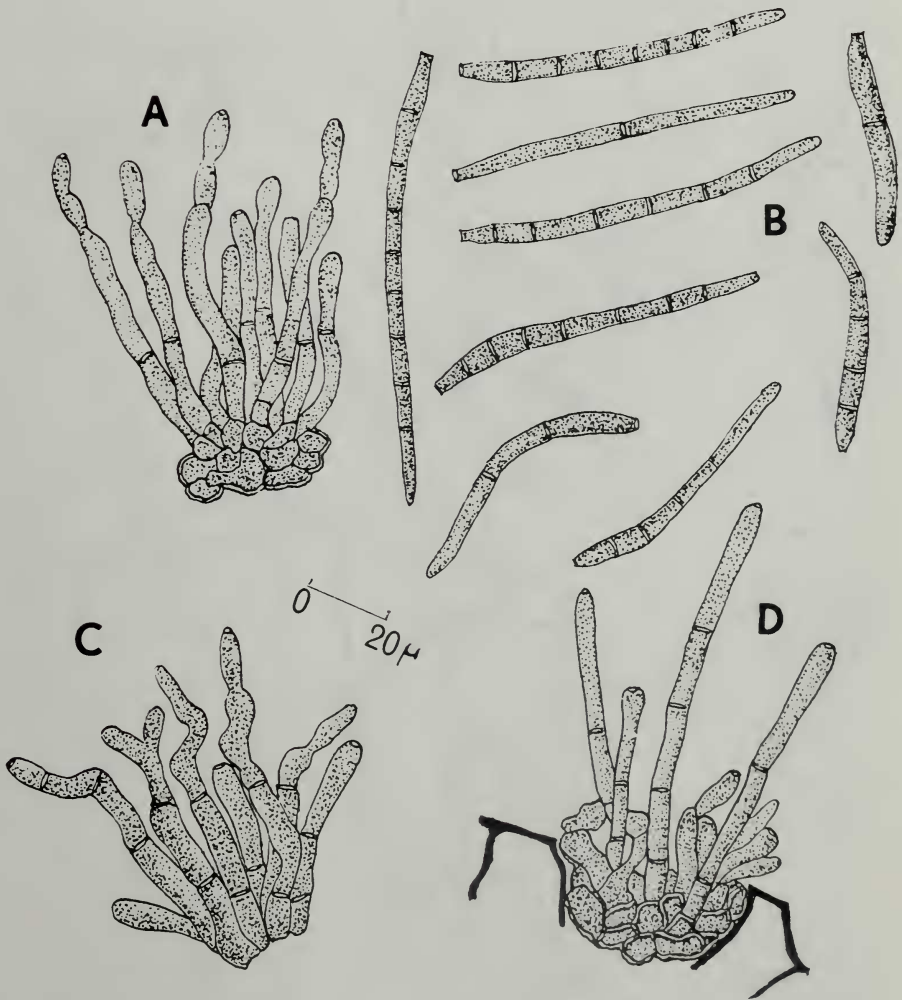


Fig. 34. *Pseudocercospora chrysanthemicola* (Yen) Deighton: A, fascicle of young conidiophores and stromata; B, conidia; C & D, fascicle of old conidiophores.

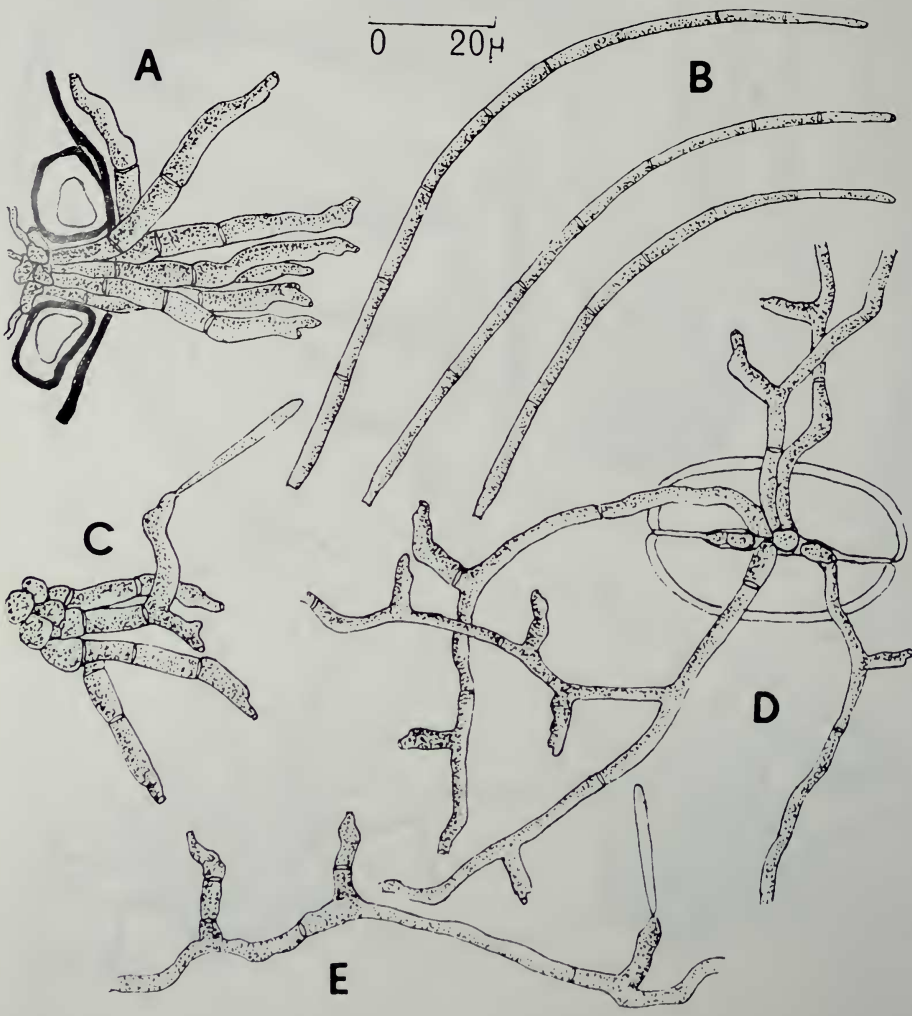


Fig. 35. *Pseudocercospora cordiicola* (Yen) Yen: A & C, fascicle of conidiophores; B, conidia; D & E, external hyphae and unbranched conidiophores.

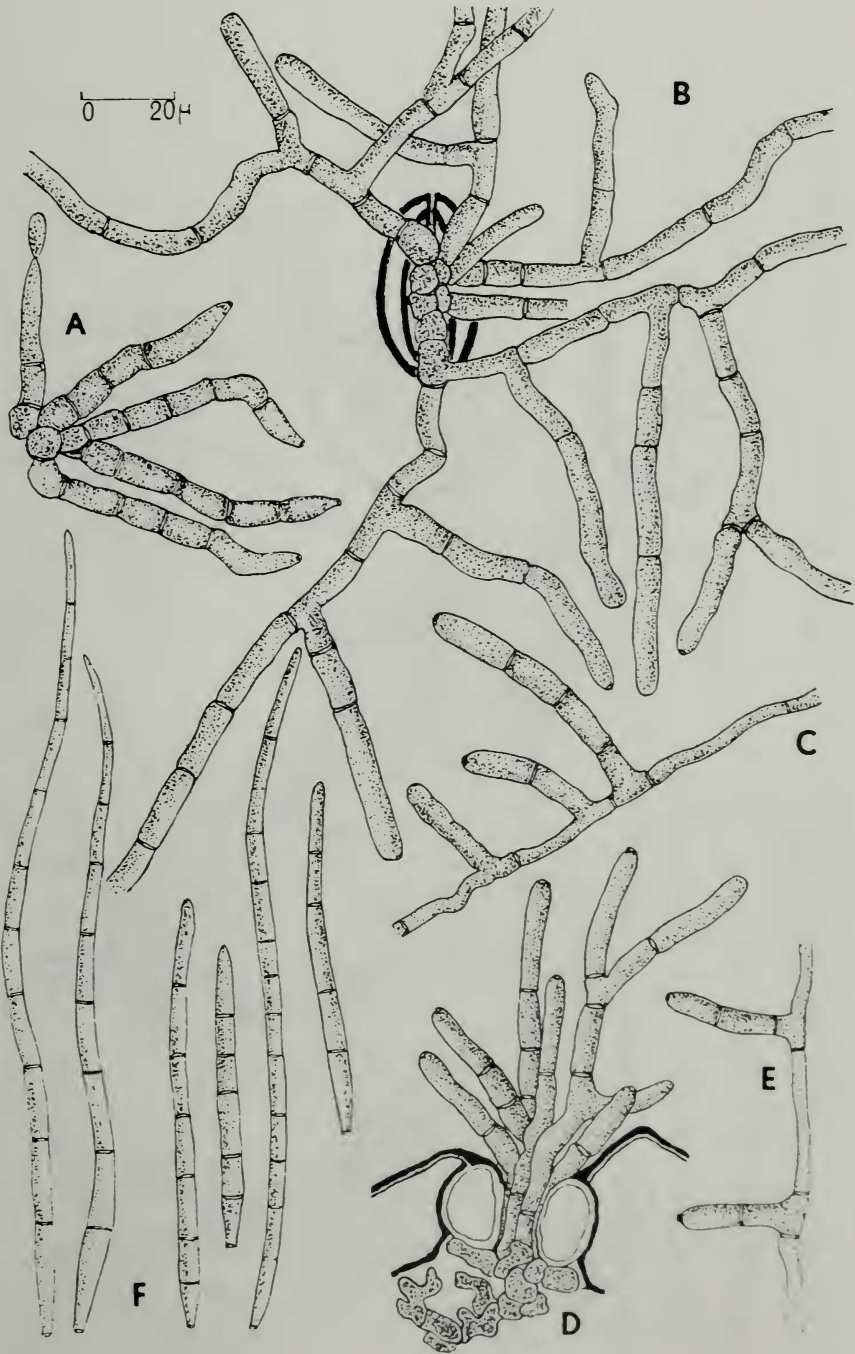


Fig. 36. *Pseudocercospora crotalaricola* (Yen) Yen: A, fascicle of young conidiophores; B, old conidiophores and external hyphae; C & E, external hyphae and unbranched conidiophores; D, branched conidiophores; F, conidia.

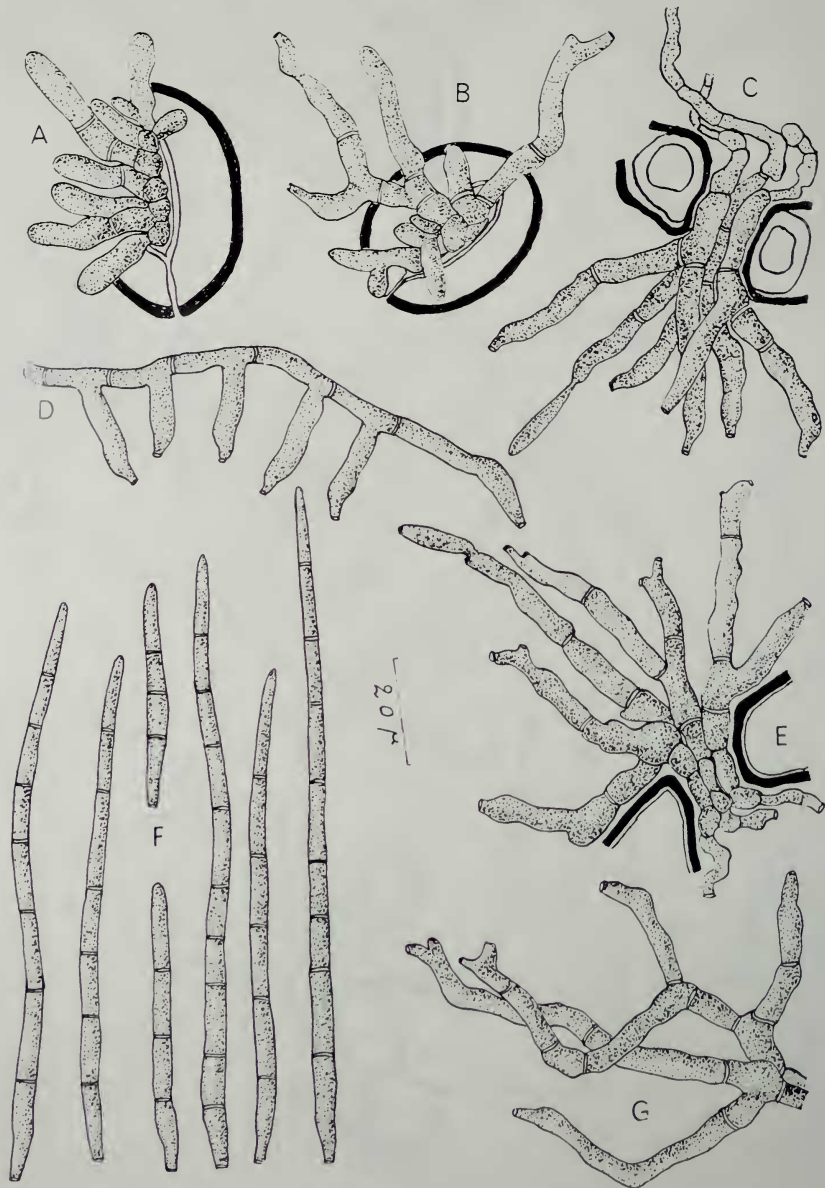


Fig. 37. *Pseudocercospora daturina* (Yen) Deighton: A, fascicle of young conidiophores; B, C & E, fascicle of old conidiophores; F, conidia; G, branched conidiophores.

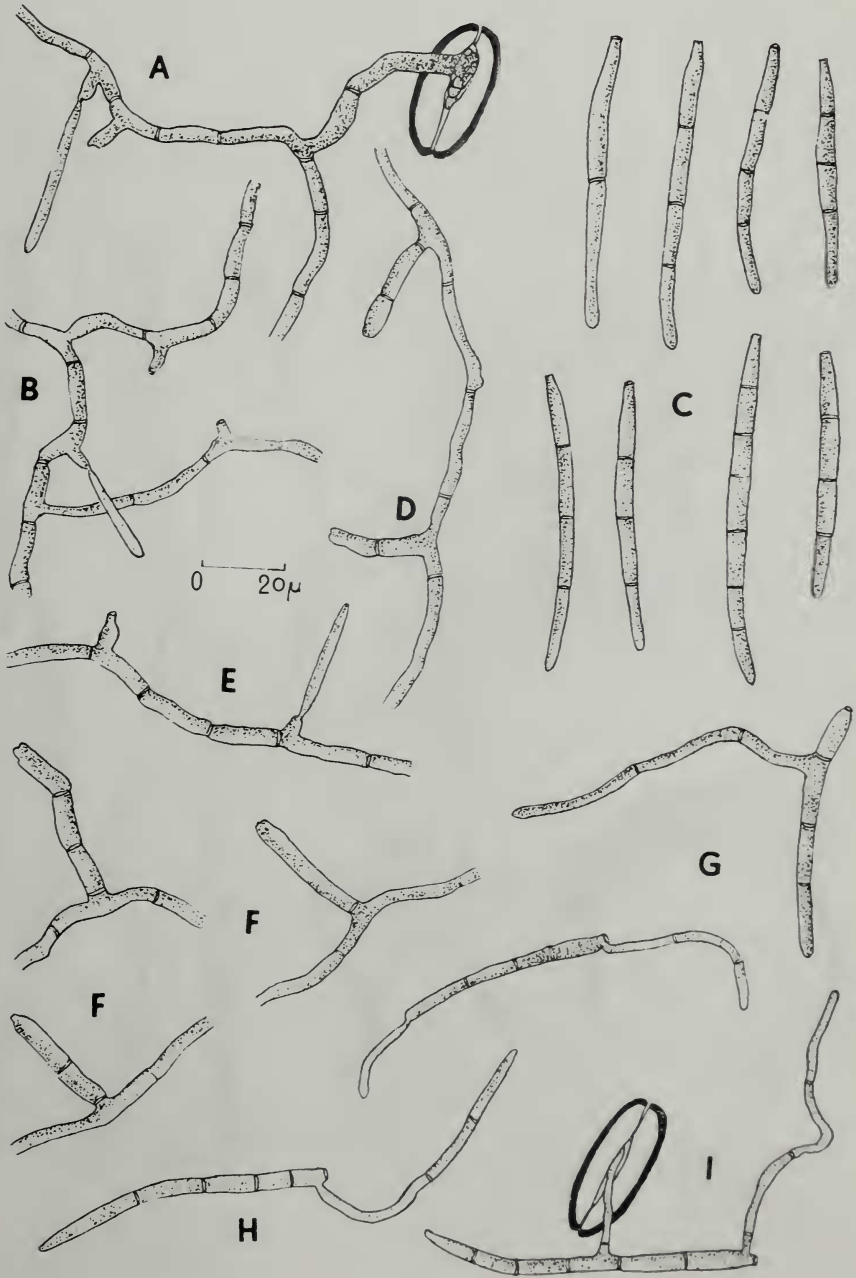


Fig. 38. *Pseudocercospora delonicis* (Yen) Yen: A, B, D, E & F, external hyphae and unbranched conidiophores; C, conidia; G & H, germination of conidia; I, infection by germinative tube through leaf stoma.

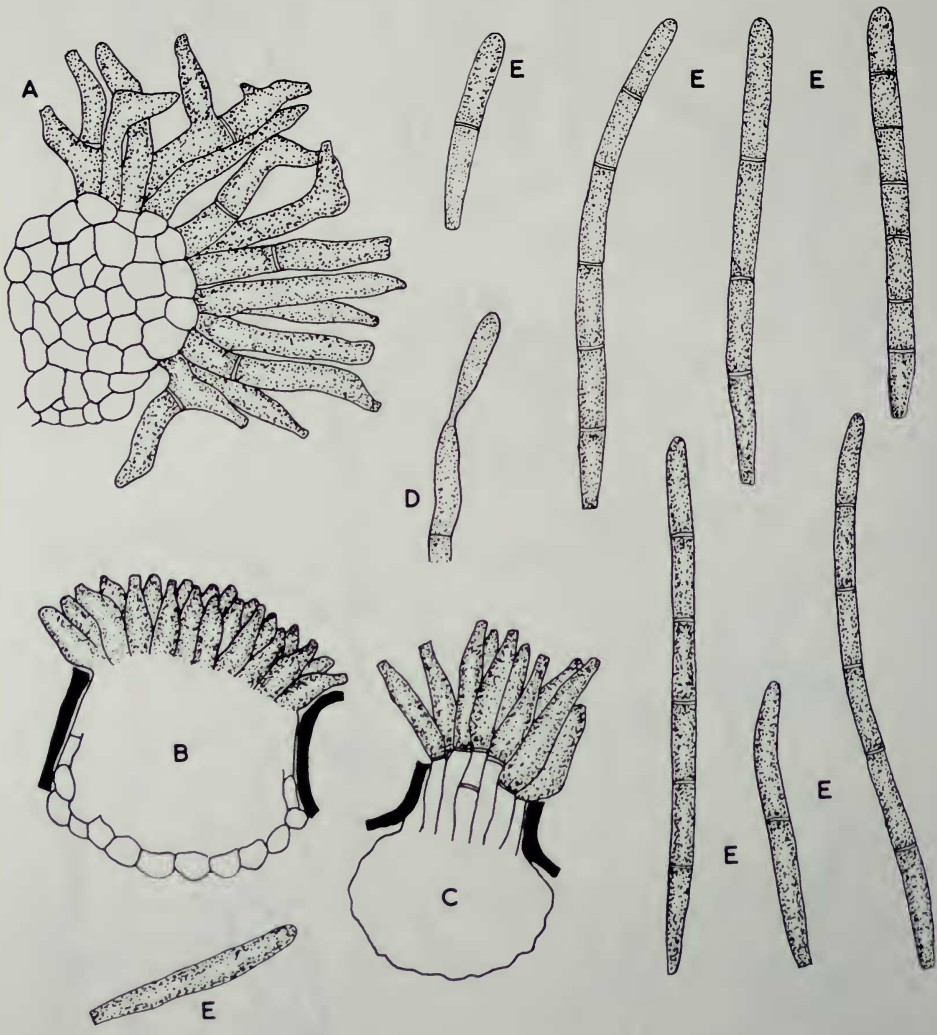


Fig. 39. *Pseudocercospora ervatamiae* (Yen & Lim) Yen: A, fascicle of old conidiophores and stromata; B & C, fascicle of young conidiophores; D, formation of conidia; E, conidia.

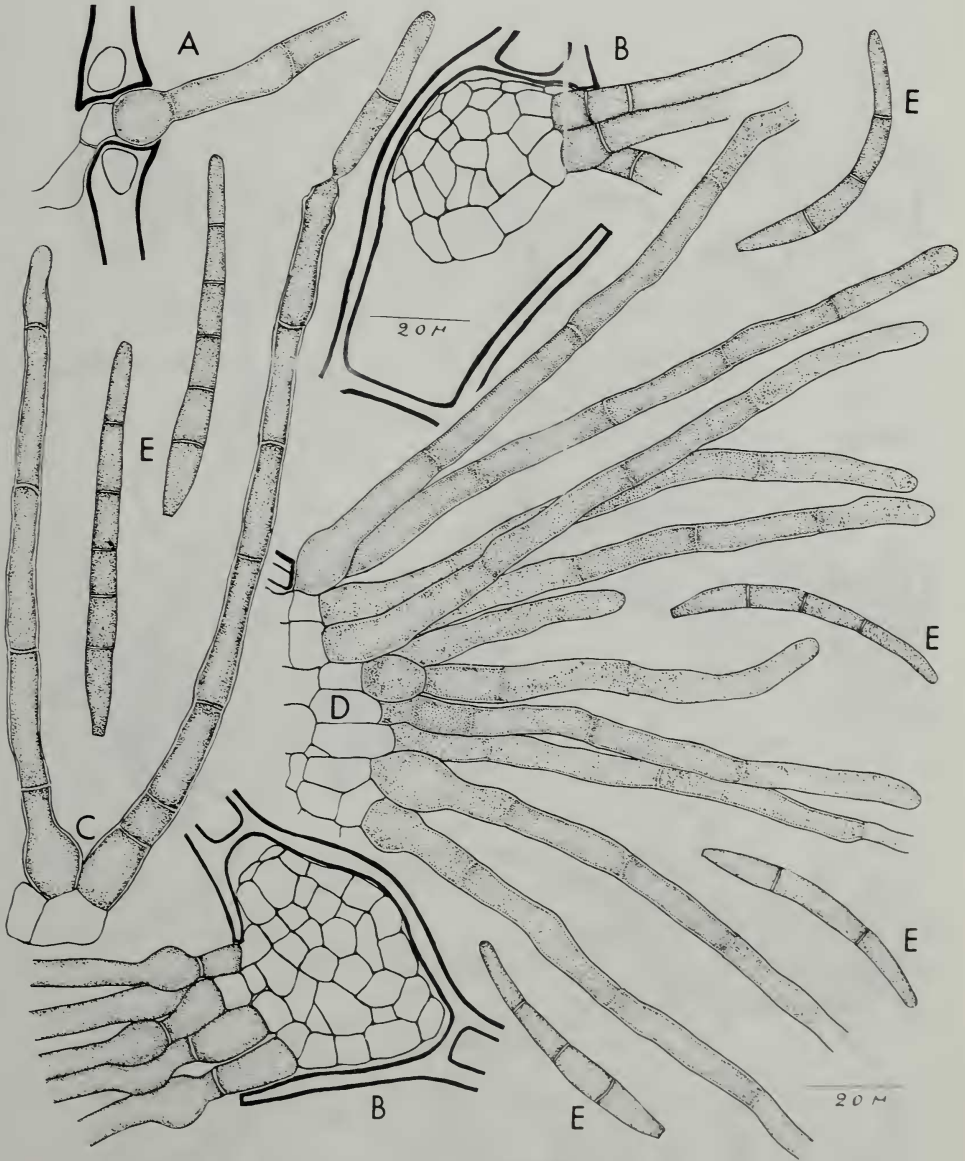


Fig. 40. *Pseudocercospora fici-chartaceae* (Yen & Lim) Yen: A & C, conidiophores emerging through stomata; B, fascicle of young conidiophores emerging through rupture of epidermis; D, fascicle of old conidiophores; E, conidia.

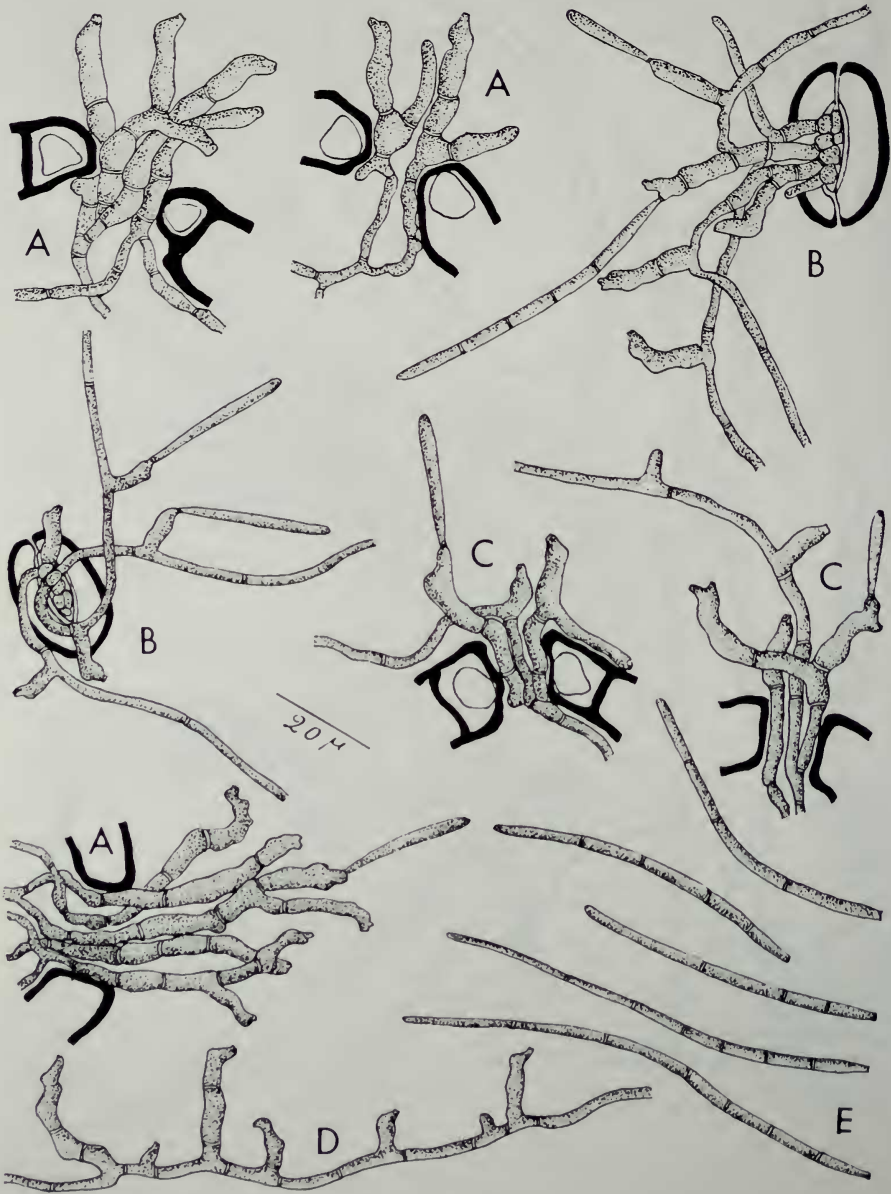


Fig. 41. *Pseudocercospora formosana* (Yamam.) Deighton: A & C, fascicle of old conidiophores; B & D, external hyphae and unbranched conidiophores; E, conidia.

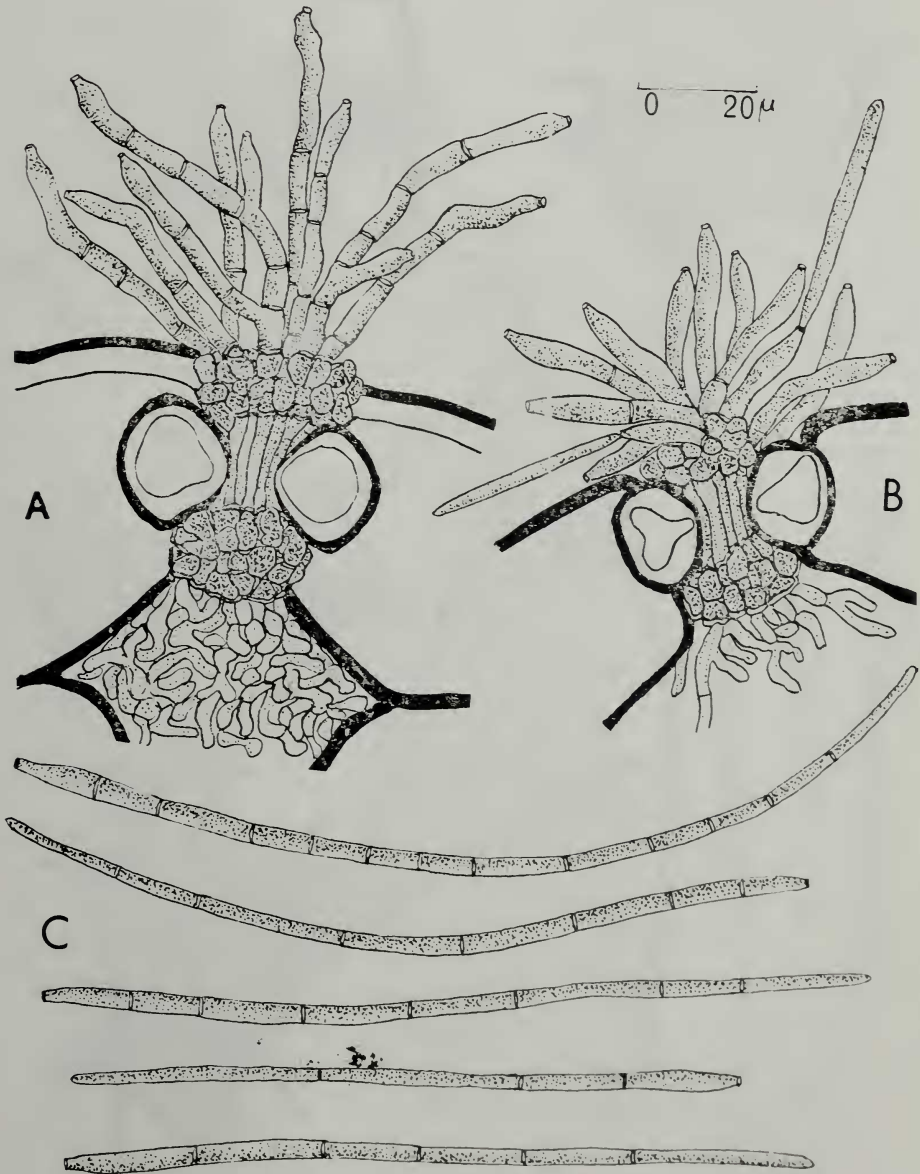


Fig. 42. *Pseudocercospora globosae* (Yen) Deighton: A, fascicle of old conidiophores and stromata; B, fascicle of young conidiophores; C, conidia.

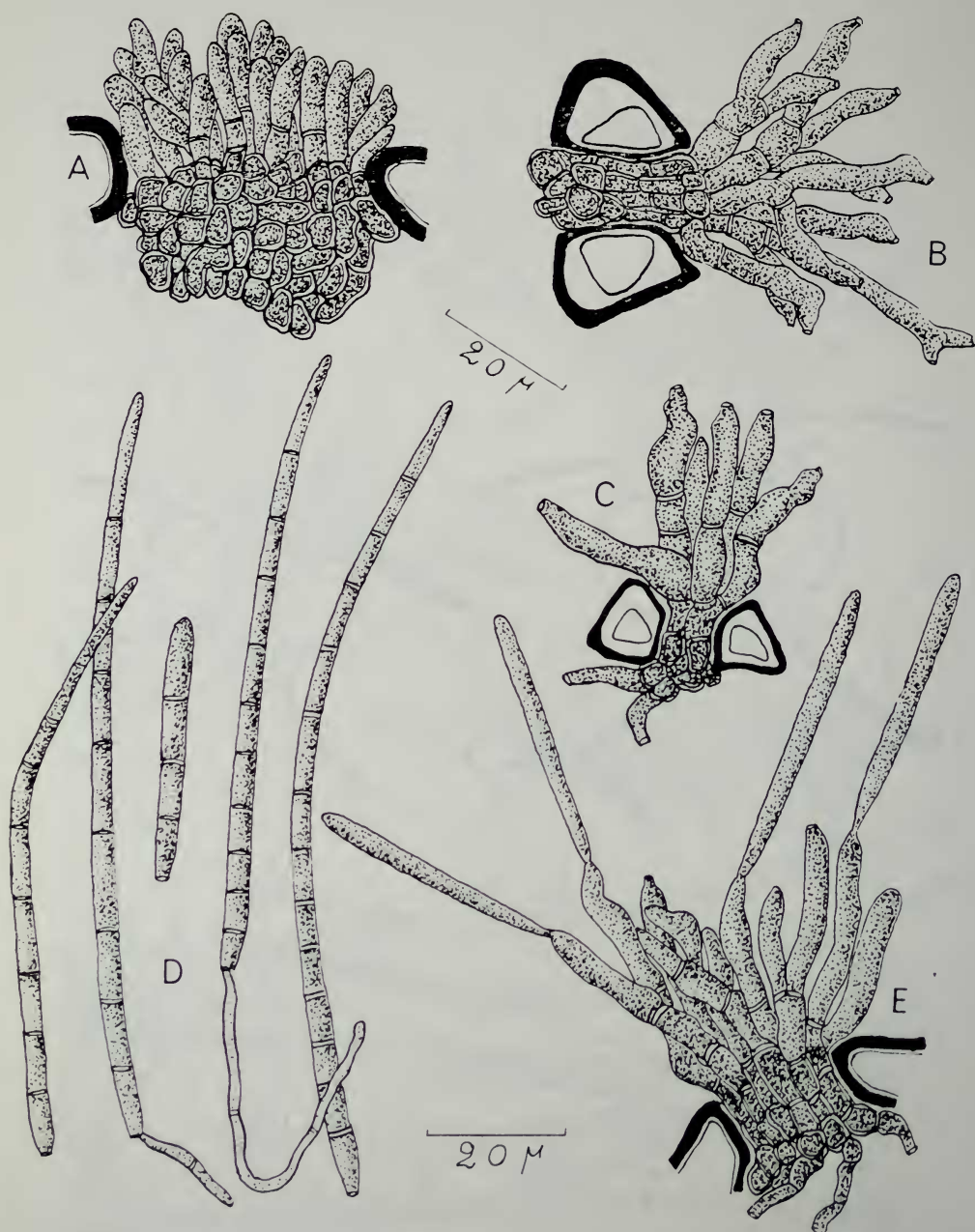


Fig. 43. *Pseudocercospora ipomoeae-purpureae* (Yen) Yen: A, fascicle of young conidiophores and stromata; B & C, fascicle of old conidiophores; D, conidia and germination of conidia; E, formation of conidia.

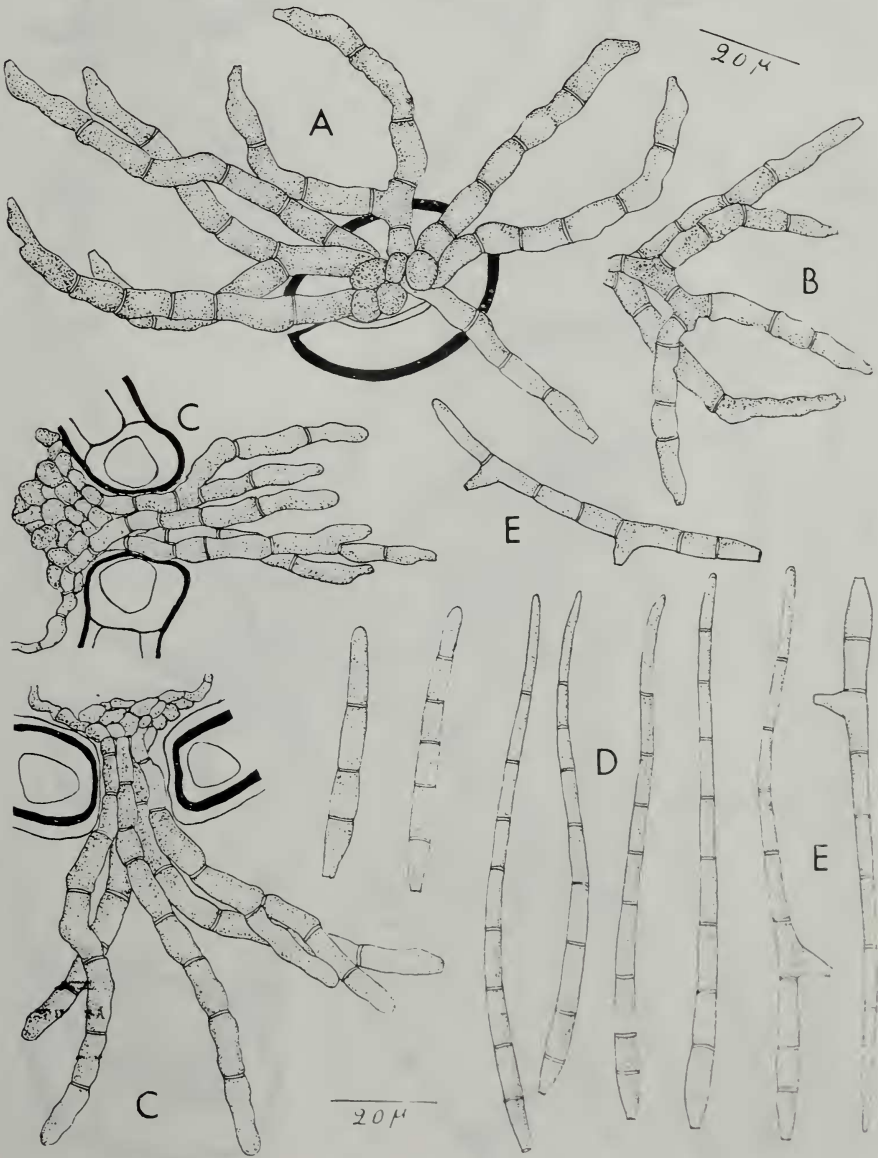


Fig. 44. *Pseudocercospora ixoricola* (Yen) Yen: A & B, fascicles of old conidiophores; C, fascicle of young conidiophores; D, conidia; E, germination of conidia.

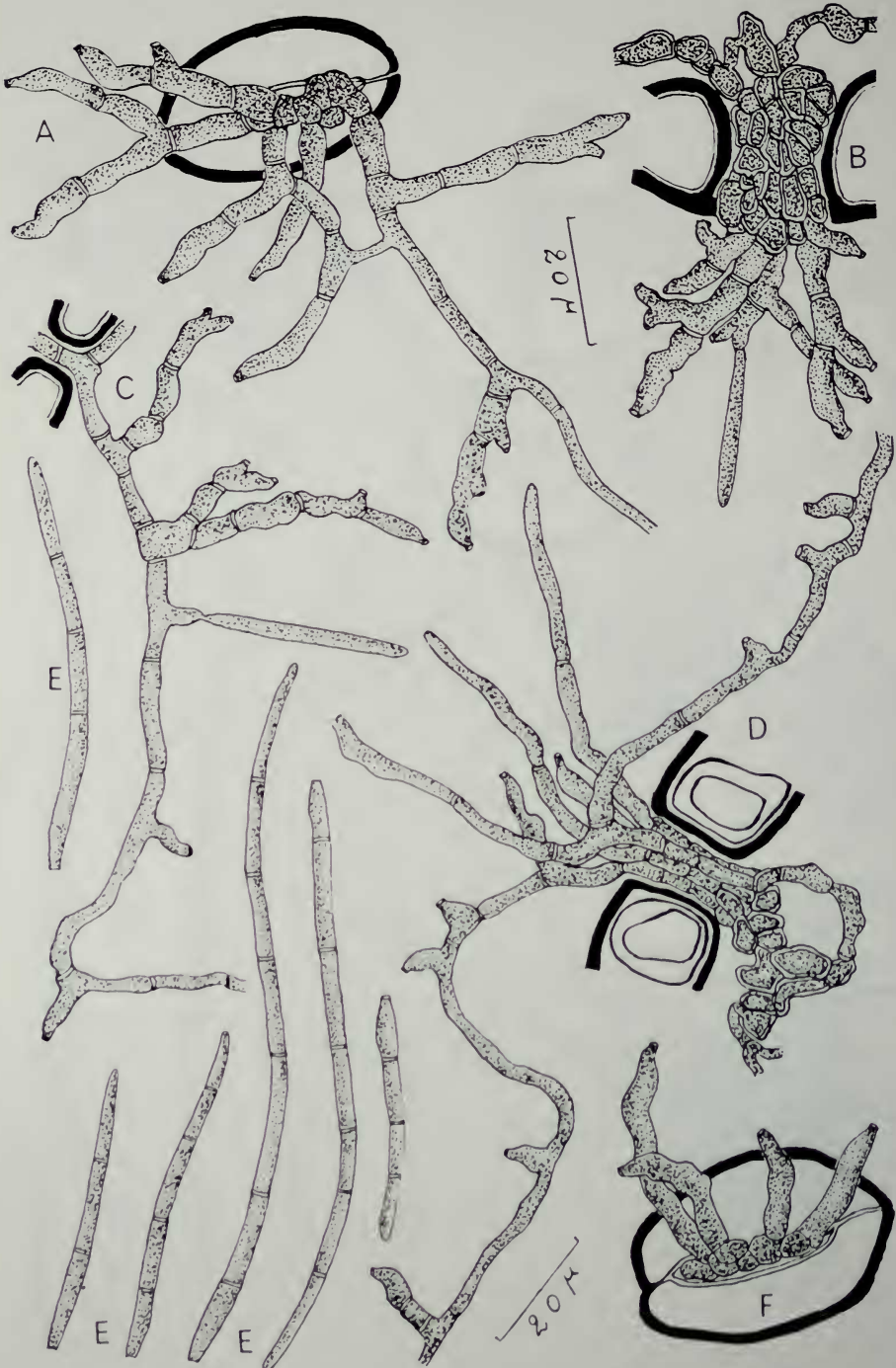


Fig. 45. *Pseudocercospora jatrophae-curcas* (Yen) Deighton: A & B, fascicles of old conidiophores; C & D, external hyphae and unbranched conidiophores; E, conidia; F, fascicle of young conidiophores.

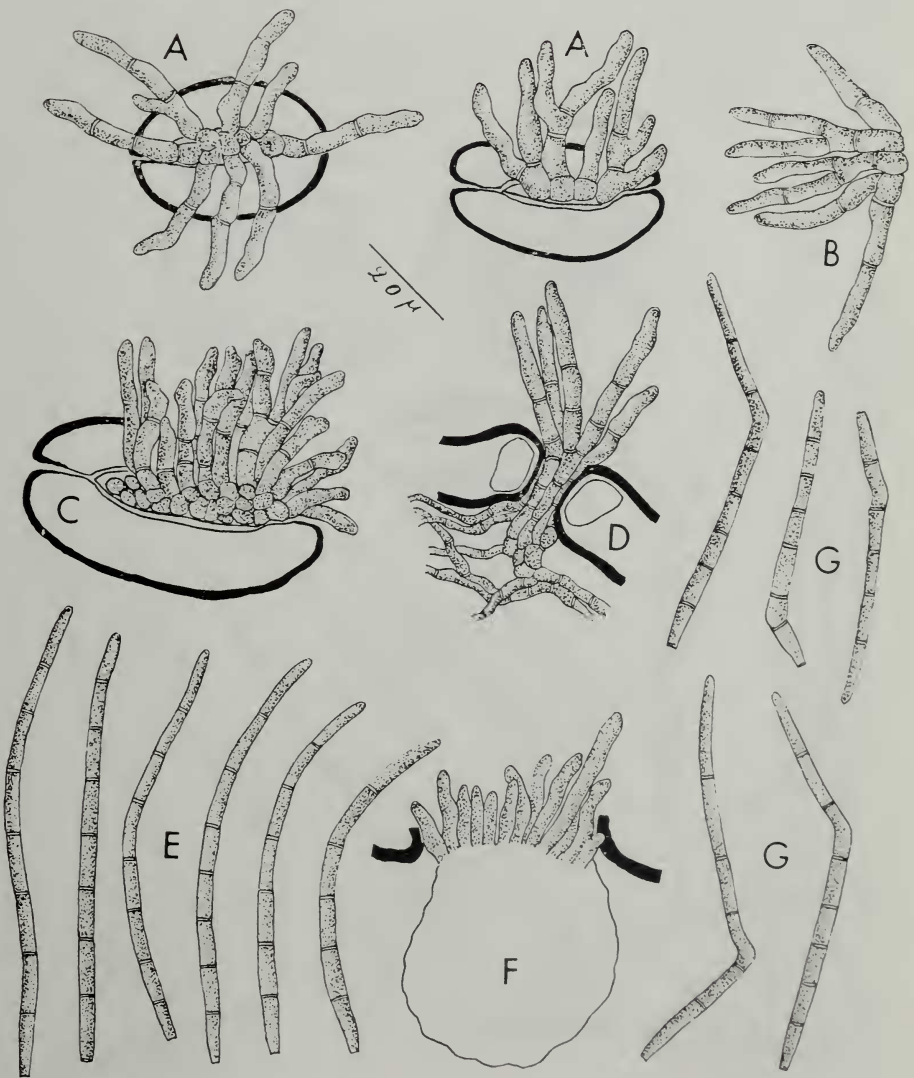


Fig. 46. *Pseudocercospora katongensis* (Yen) Yen: A, B & D, meagre fascicles; C & F, dense fascicles of conidiophores and stomata; E, conidia; G, geniculate conidia.

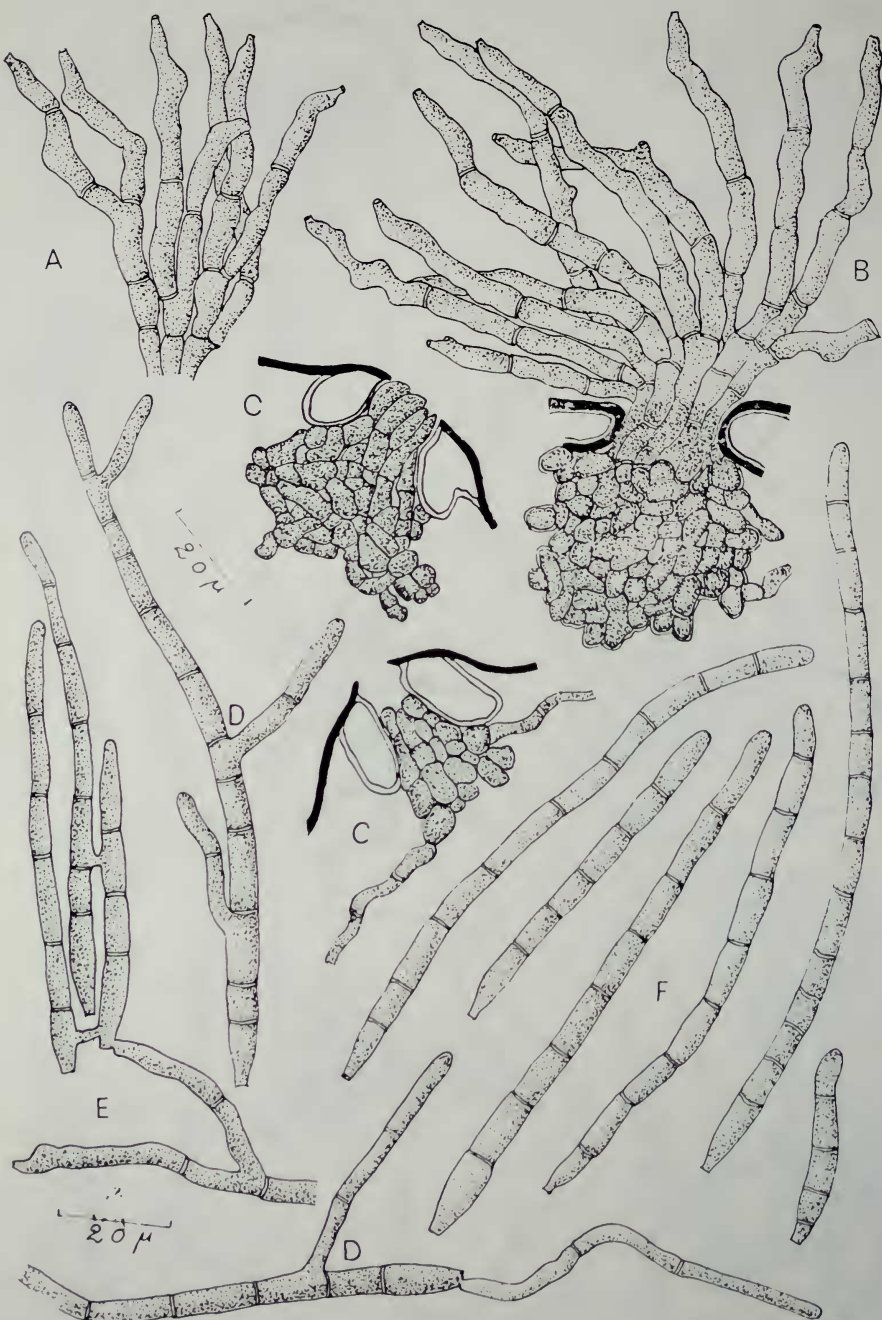


Fig. 47. *Pseudocercospora lyciicola* (Yen) Yen: A & B, fascicles of old conidiophores and stromata; C, formation of stromata; D, germination of conidia; E, anastomosis of conidia; F, conidia.

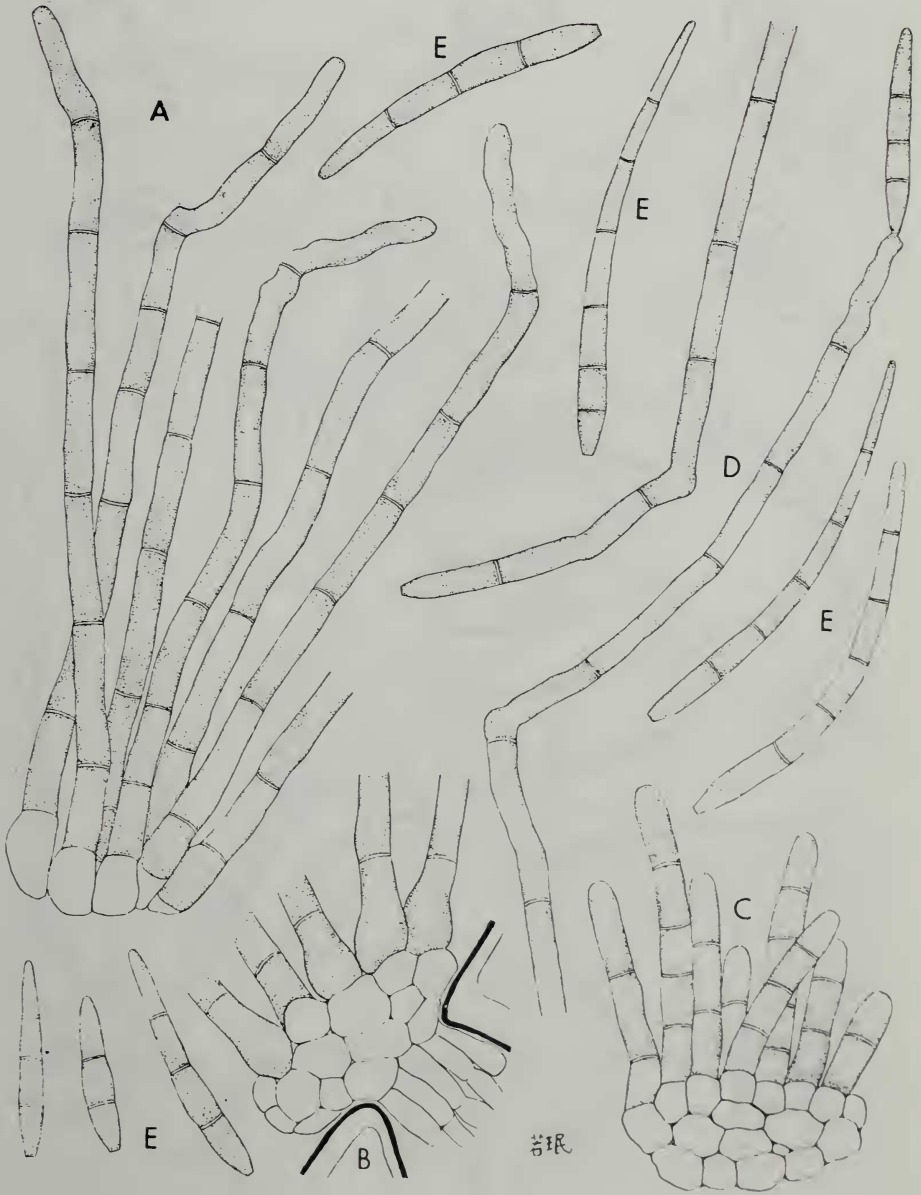


Fig. 48. *Pseudocercospora macarangae* (Syd.) Deighton: A & B, fascicles of old conidiophores and stromata; C, fascicle of young conidiophores; D, formation of conidia; E, conidia.



Fig. 49. *Pseudocercospora peltophori* (Yen) Yen: A-E, fascicles of conidiophores; F & G, external hyphae and unbranched conidiophores; H-J, germination of conidia; K, conidia.

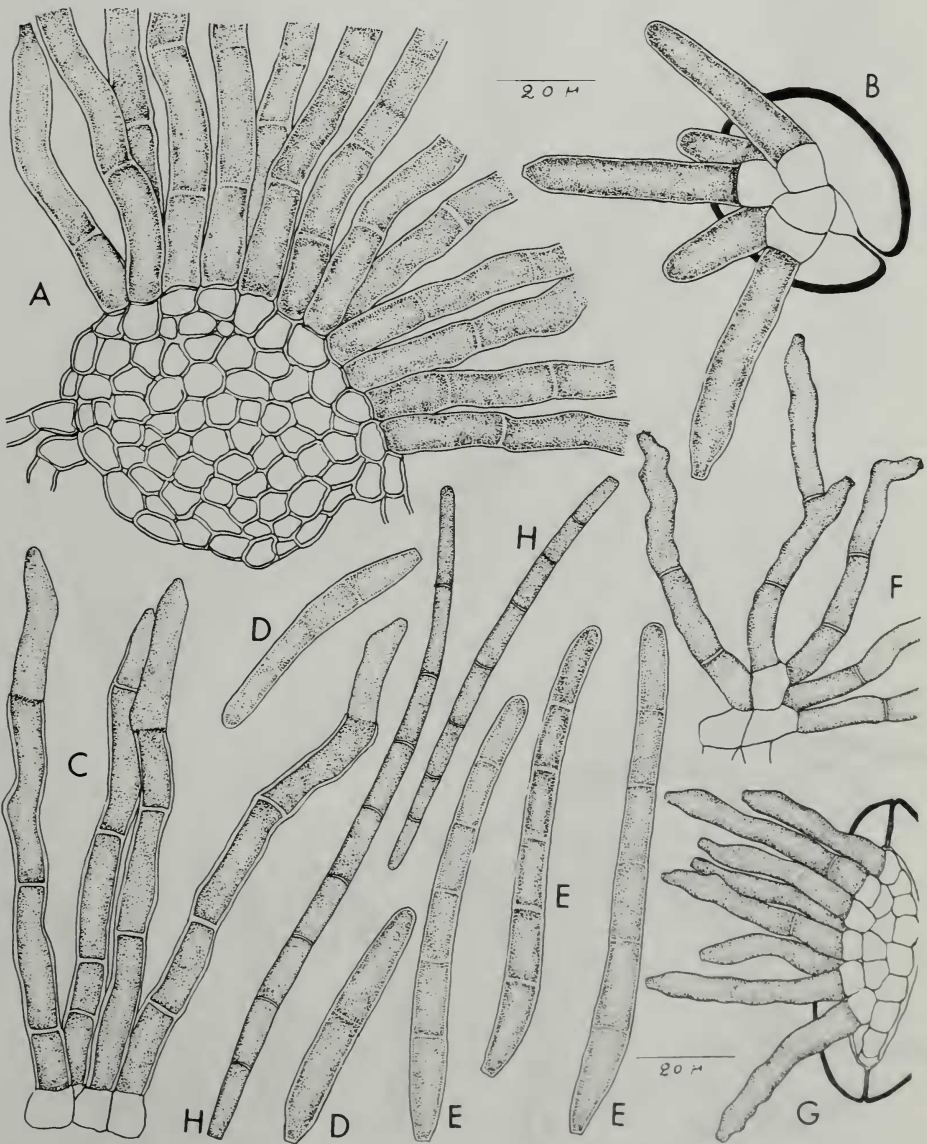


Fig. 50. *Pseudocercospora pergulariae* (Yen & Lim) Yen (A-E): A, fascicle of conidiophores and stromata; B, fascicle of young conidiophores; C, old conidiophores; D & E, conidia. *Pseudocercospora timorensis* (Cooke) Deighton (F-H): F, old conidiophores; G, fascicle of young conidiophores; H, conidia.

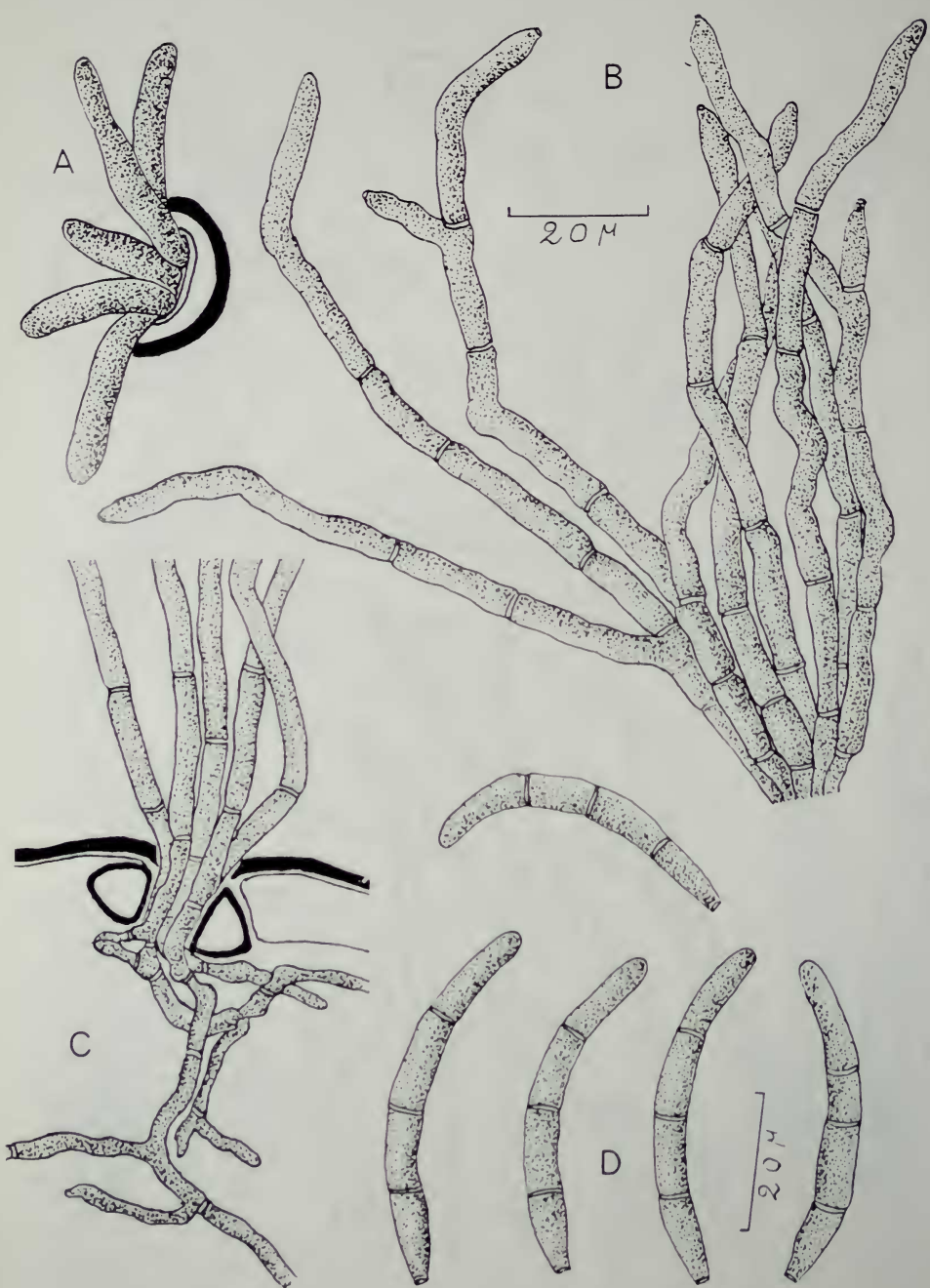


Fig. 51. *Pseudocercospora phyllanthi-niruri* (Yen) Yen: A, fascicle of young conidiophores; B & C, fascicles of old conidiophores; D, conidia.

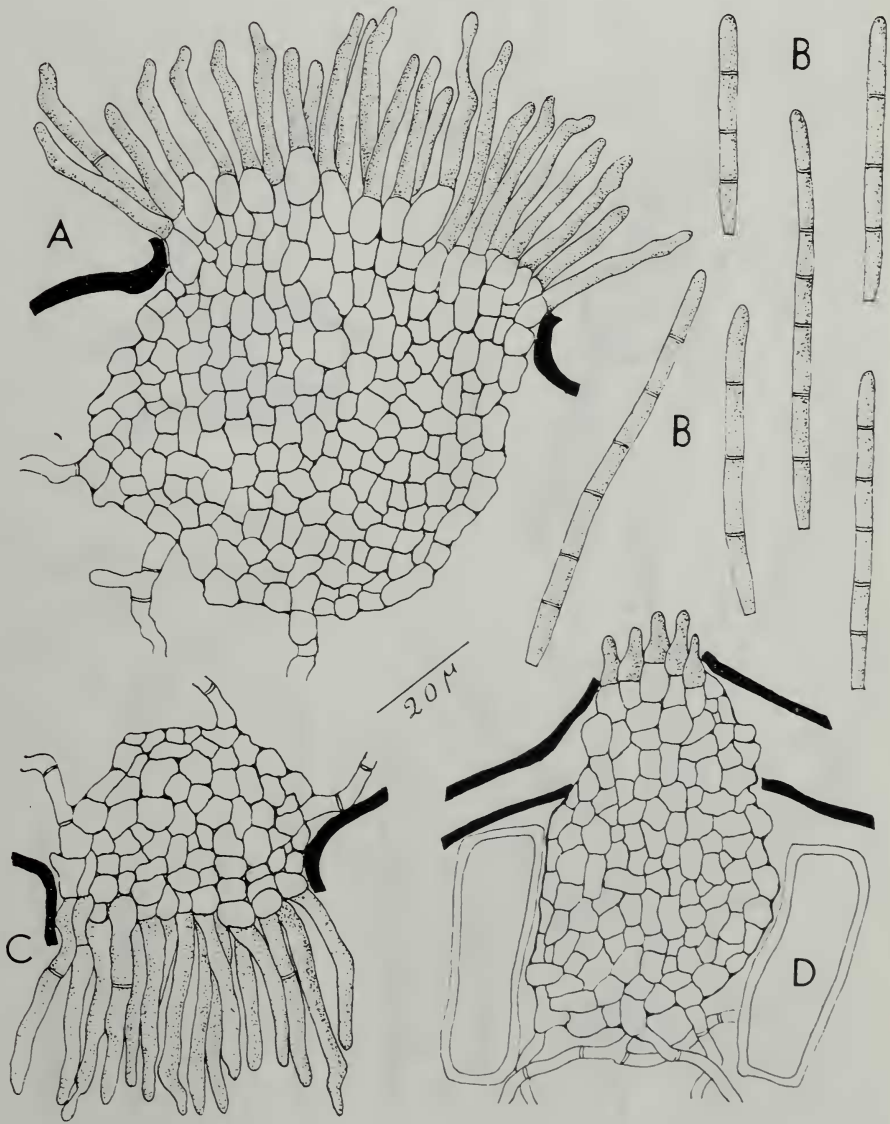


Fig. 52. *Pseudocercospora piperina* (Yen) Yen: A & C, fascicles of conidiophores; B, conidia; D, formation of stromata.

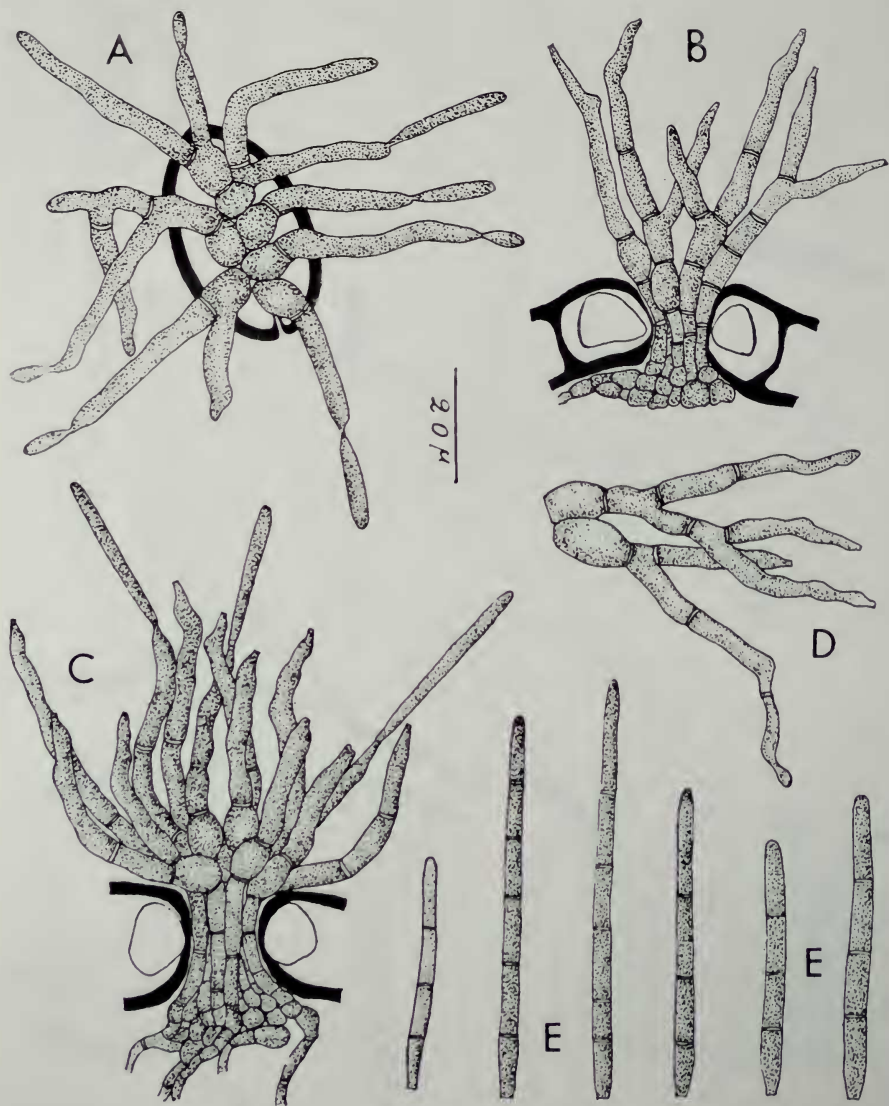


Fig. 53. *Pseudocercospora piperis-muricati* (Yen) Yen: A-C, fascicles of conidiophores; D, old conidiophores; E, conidia.

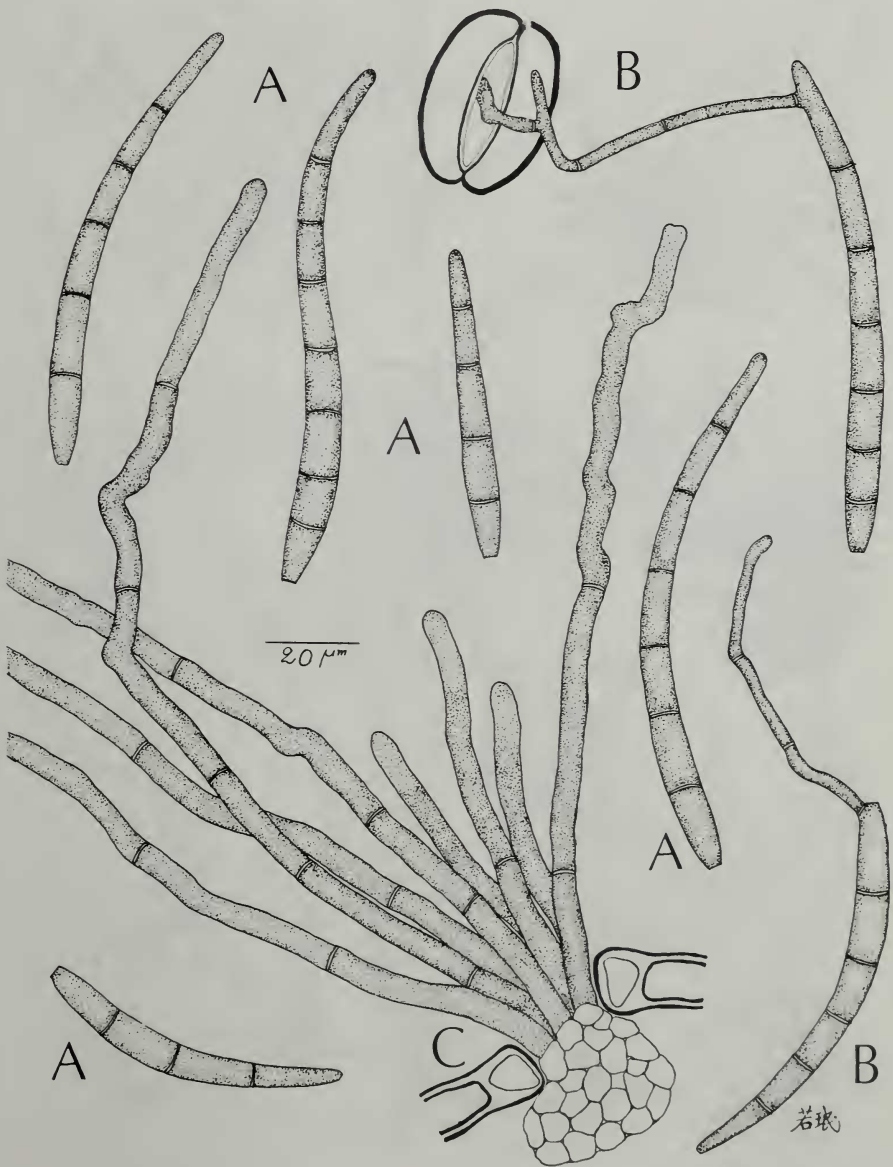


Fig. 54. *Pseudocercospora pterocarpicola* (Yen) Yen: A, conidia; B, germination of conidia; C, fascicle of conidiophores and stromata.

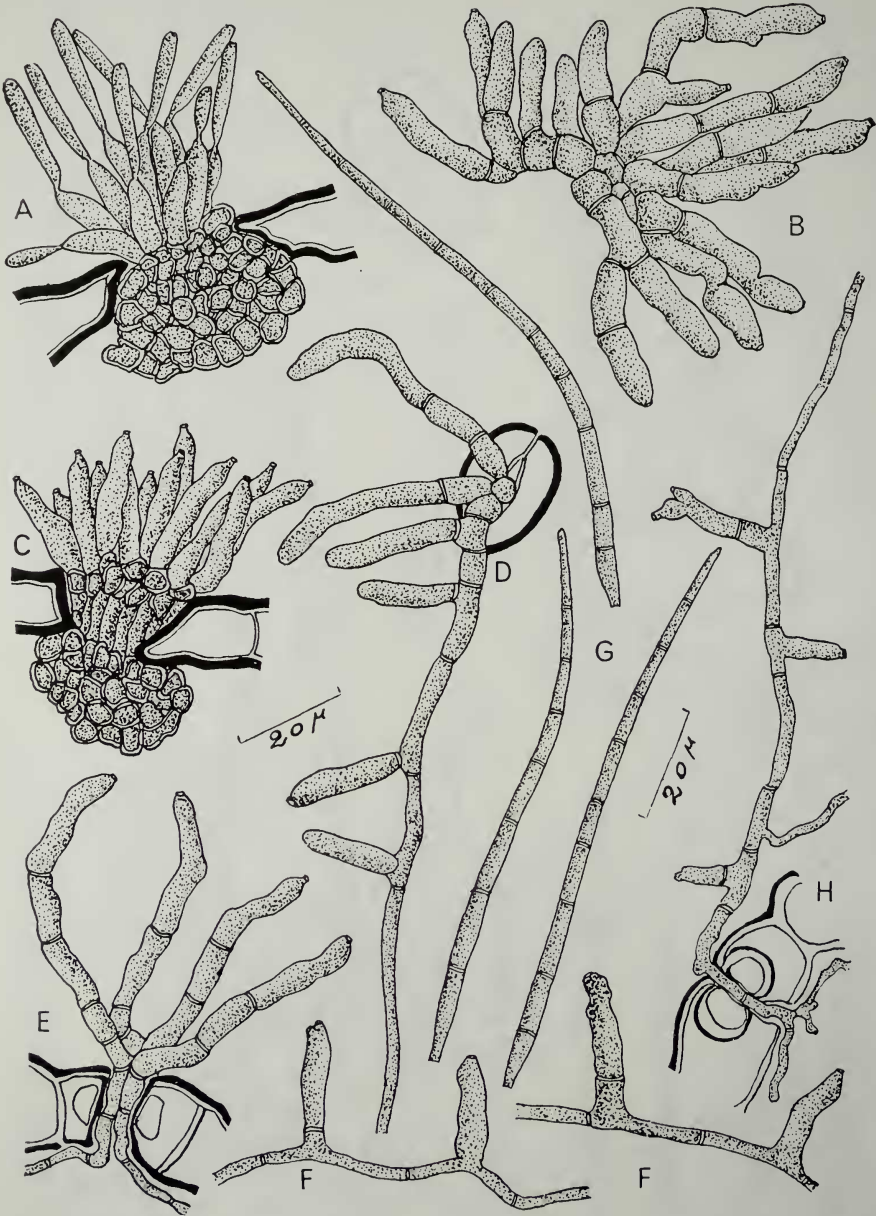


Fig. 55. *Pseudocercospora puerariicola* (Yen) Yen (A & C): A, fascicle of conidiophores and formation of conidia; C, fascicle of old conidiophores. *Pseudocercospora puerariina* (Yen) Yen (B & D-H): B & E, fascicles of conidiophores; D, F & H, external hyphae and unbranched conidiophores; G, conidia.

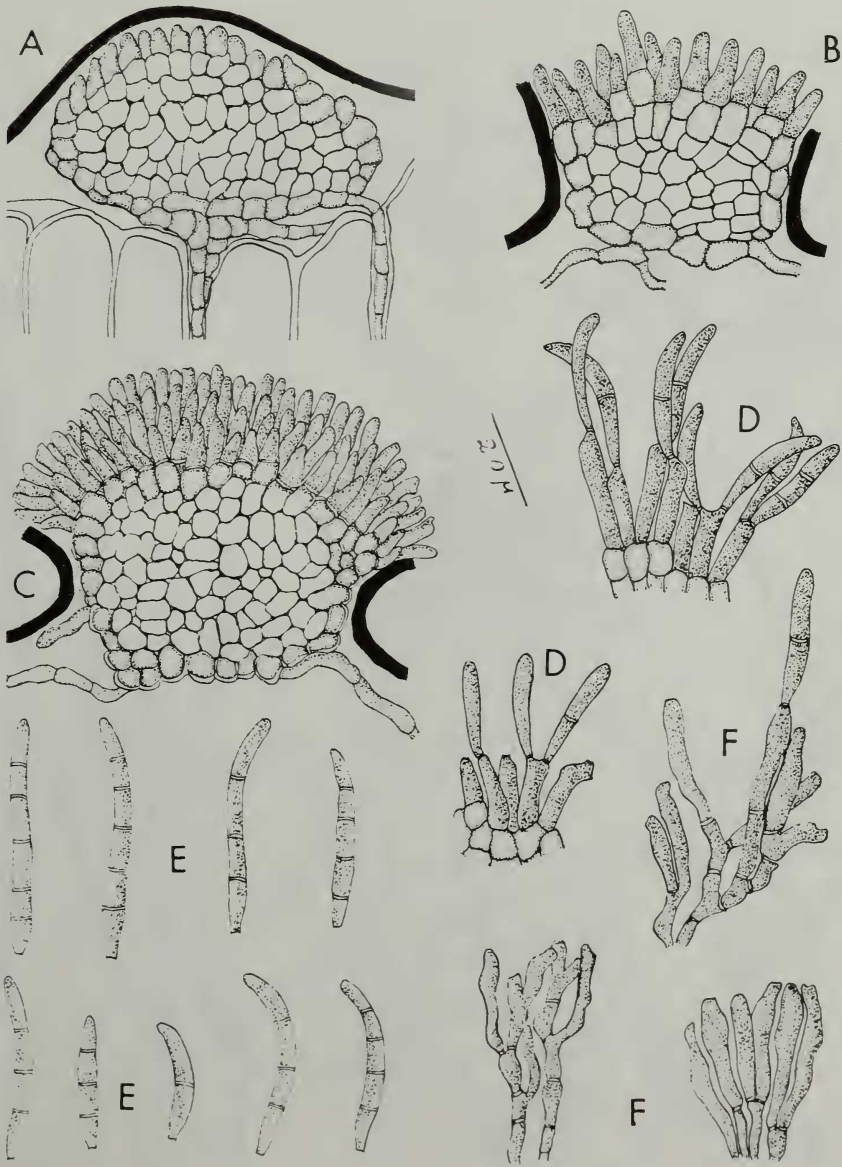


Fig. 56. *Pseudocercospora salicina* (Ell. & Ev.) Deighton: A, formation of stromata; B & C, fascicles of young conidiophores and stromata; D, old conidiophores and formation of conidia; E, conidia; F, branched conidiophores and formation of conidia.

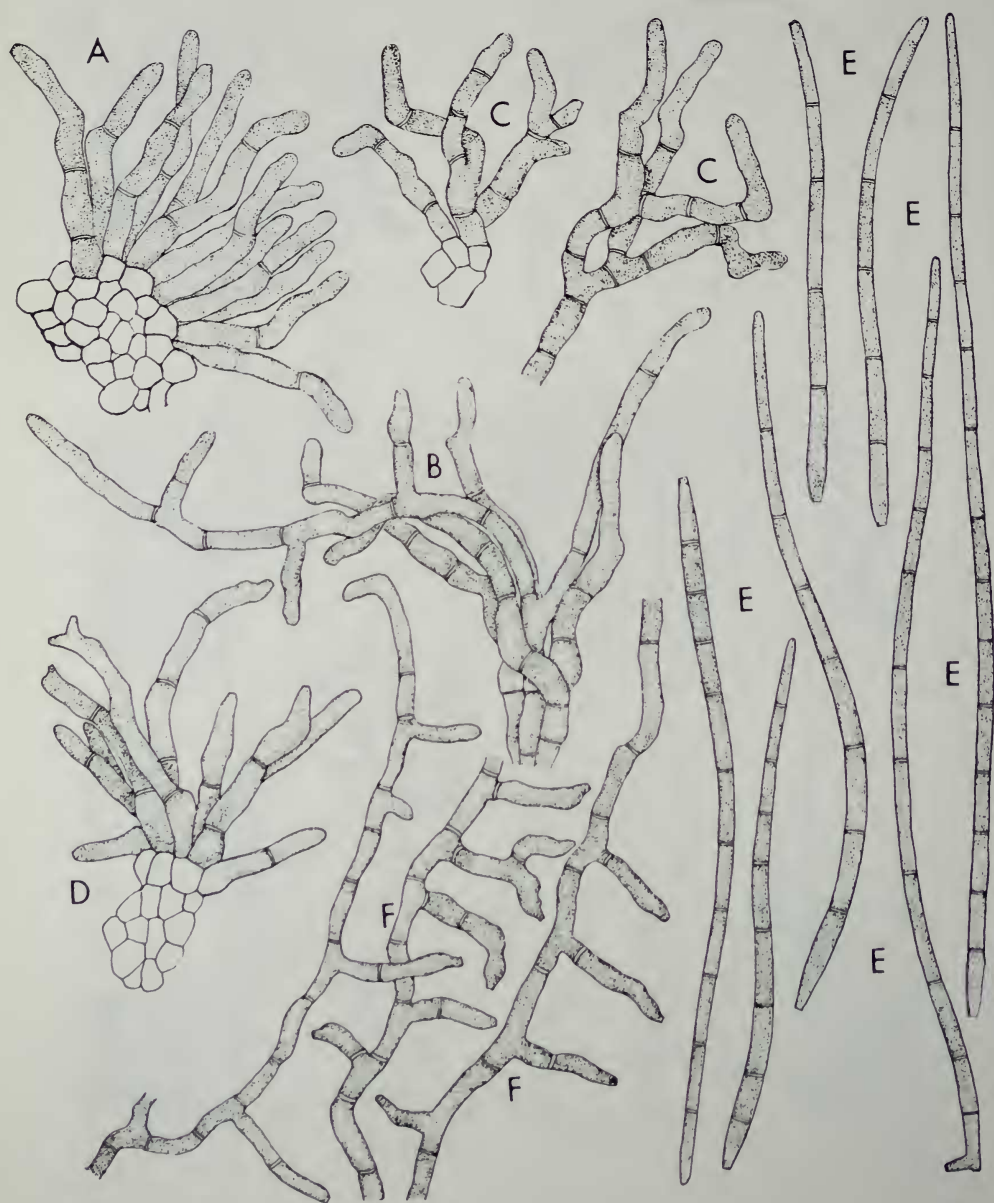


Fig. 57. *Pseudocercospora scopariicola* (Yen) Deighton: A & D, fascicles of conidiophores and stromata; C, old branched conidiophores; B & F, external hyphae and unbranched conidiophores;; E, conidia.

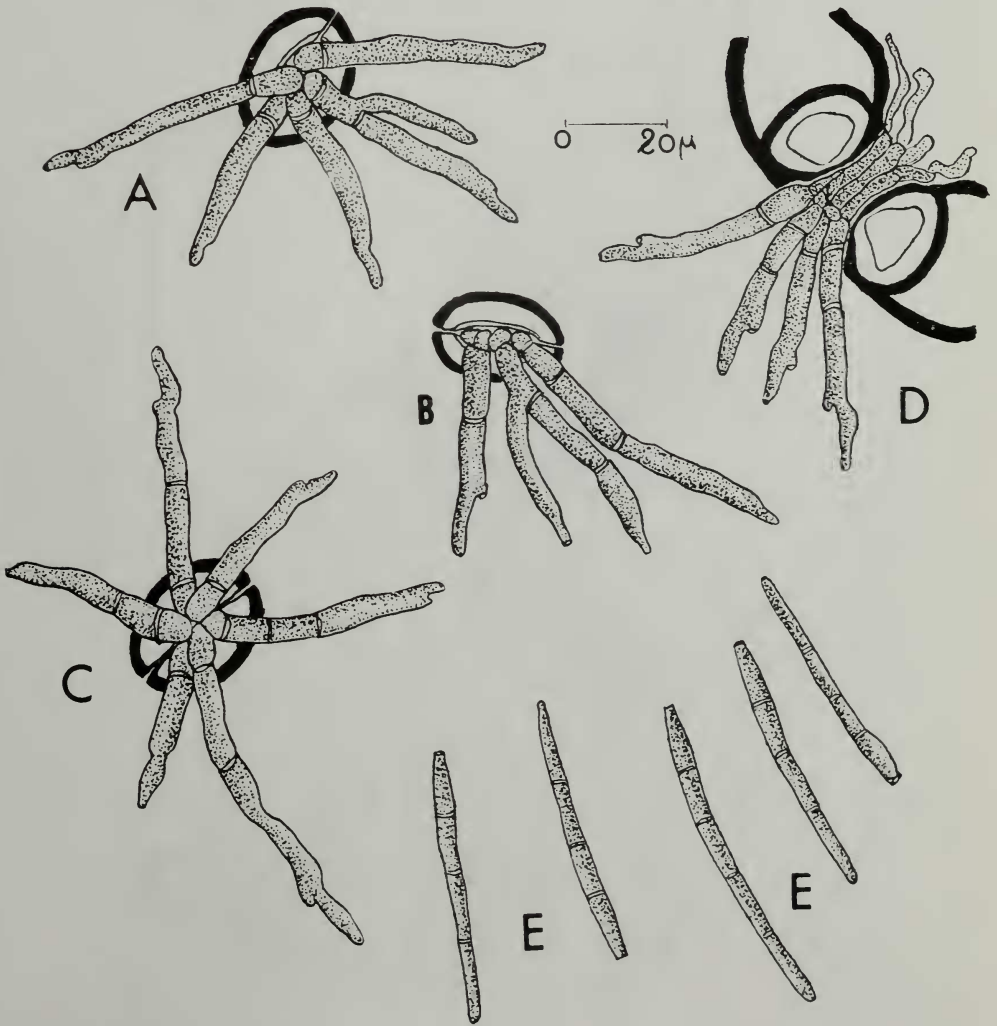


Fig. 58. *Pseudocercospora singaporensis* (Yen) Yen: A-D, fascicles of conidiophores; E, conidia.

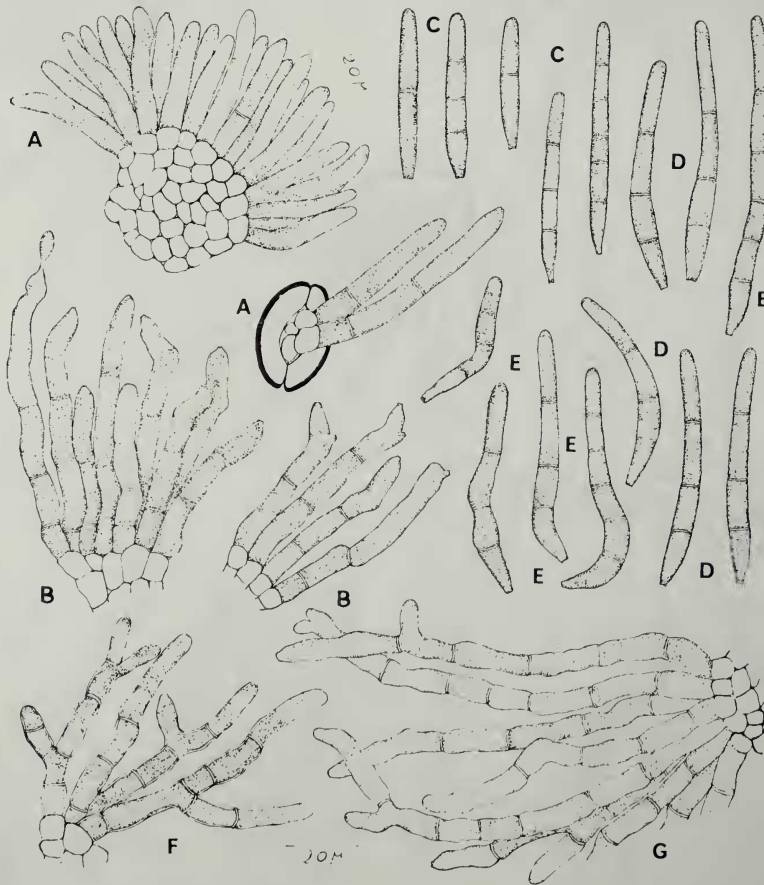


Fig. 59. *Pseudocercospora stephanotidis* (Yen) Yen: A & B, fascicles of conidiophores and stromata; C-E, conidia; F & G, old branched conidiophores.

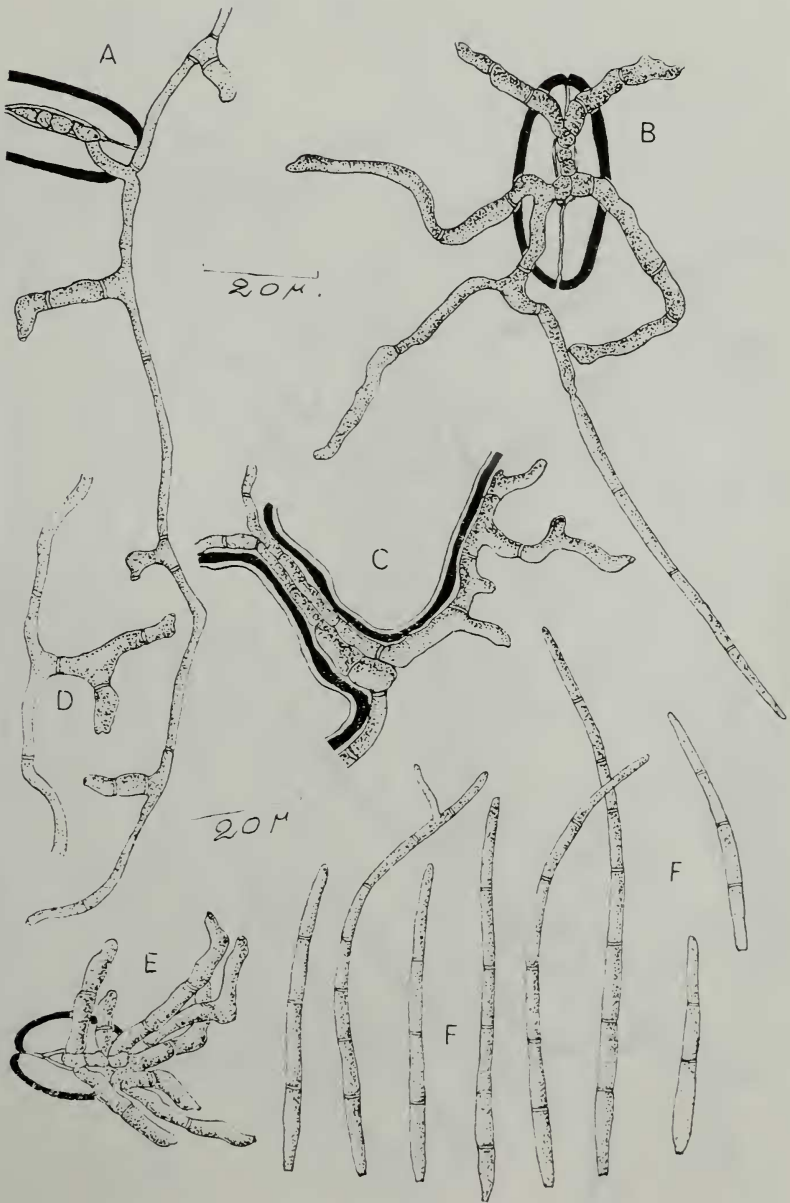


Fig. 60. *Pseudocercospora stigmaphylicola* (Yen) Deighton: B & E, fascicles of conidiophores; A, C & D, external hyphae and unbranched conidiophore; F, conidia.

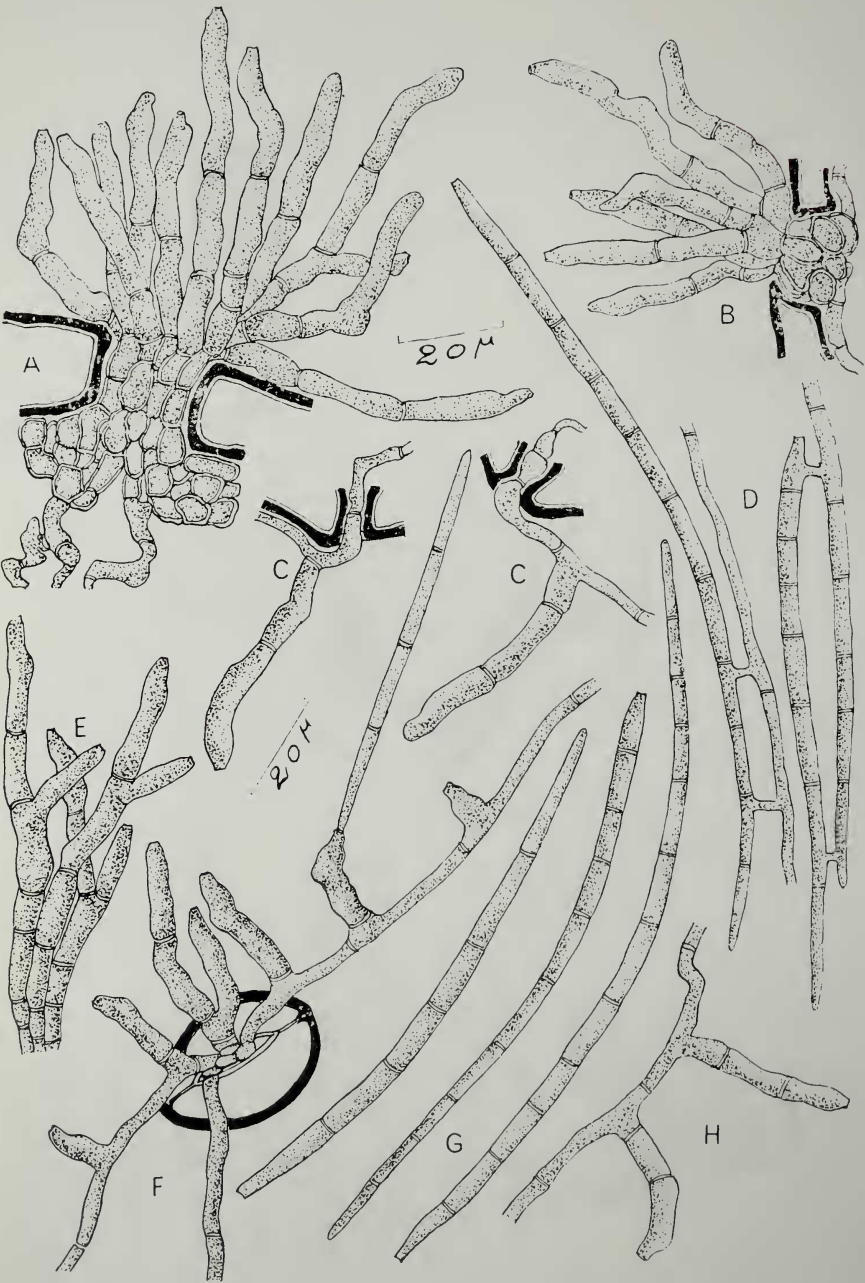


Fig. 61. *Pseudocercospora thunbergicola* (Yen) Deighton: A & B, fascicles of conidiophores; E, old conidiophores; C, F & H, external hyphae and unbranched conidiophores; D, anastomosis of conidia; G, conidia.

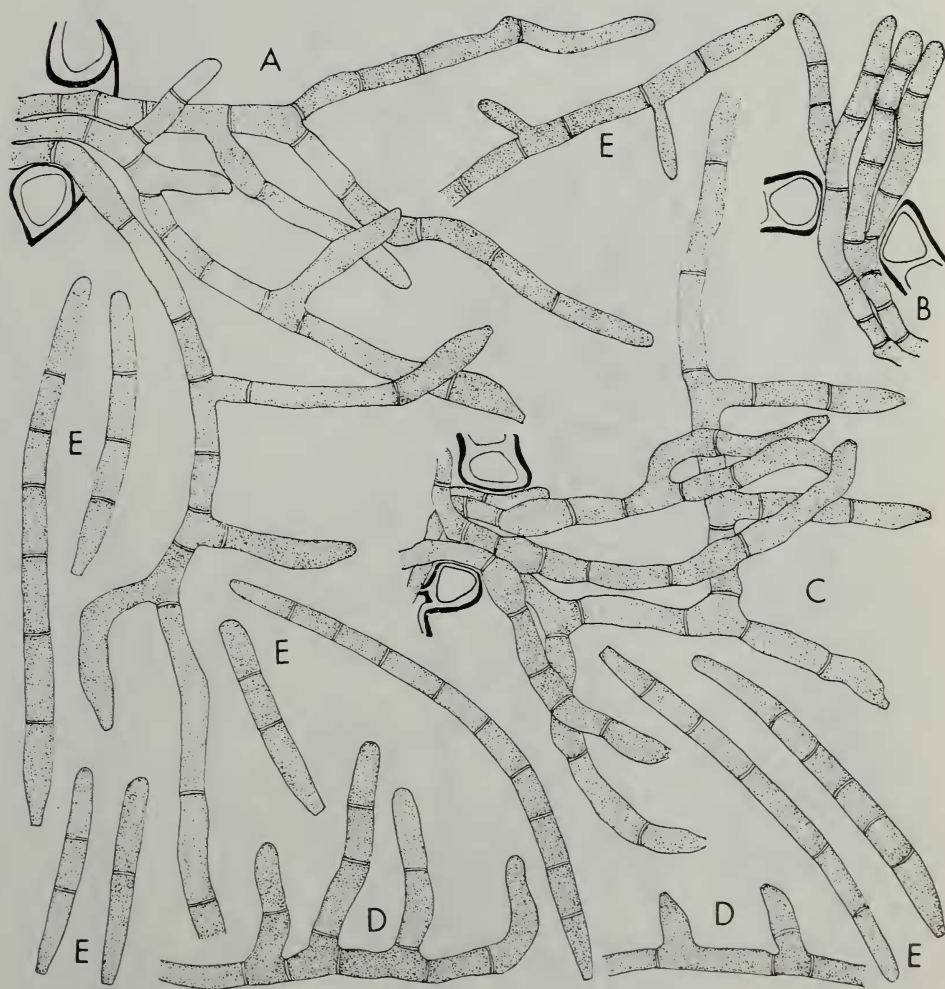


Fig. 62. *Pseudocercospora trematicola* (Yen) Deighton: A, B & C, fascicles of conidiophores and external hyphae; D, external hyphae and formation of unbranched conidiophores; E, conidia.

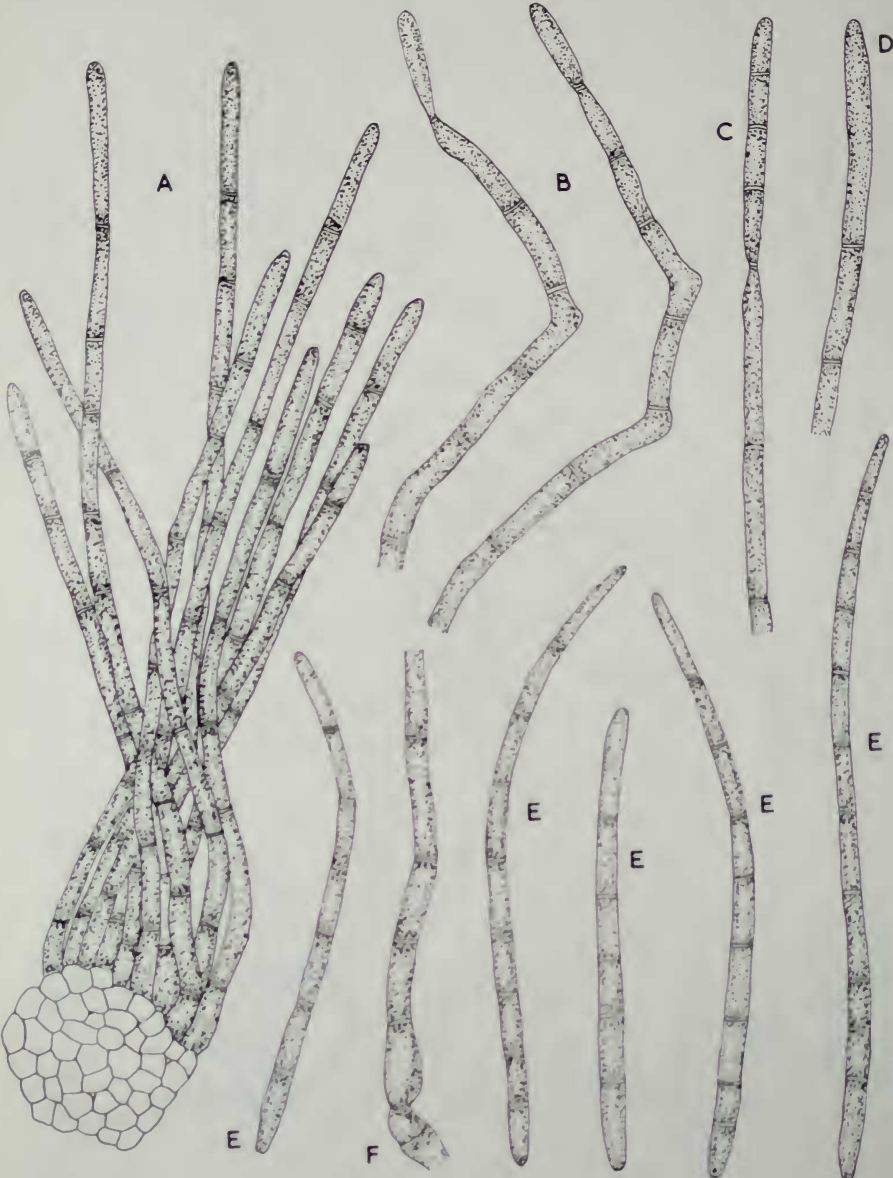


Fig. 63. *Pseudocercospora trematis-cannabini* (Yen & Lim) Deighton: A, fascicle of young conidiophores and stromata; B, C & D, ends of conidiophores and formation of conidia; E, conidia; F, base of conidiophore.

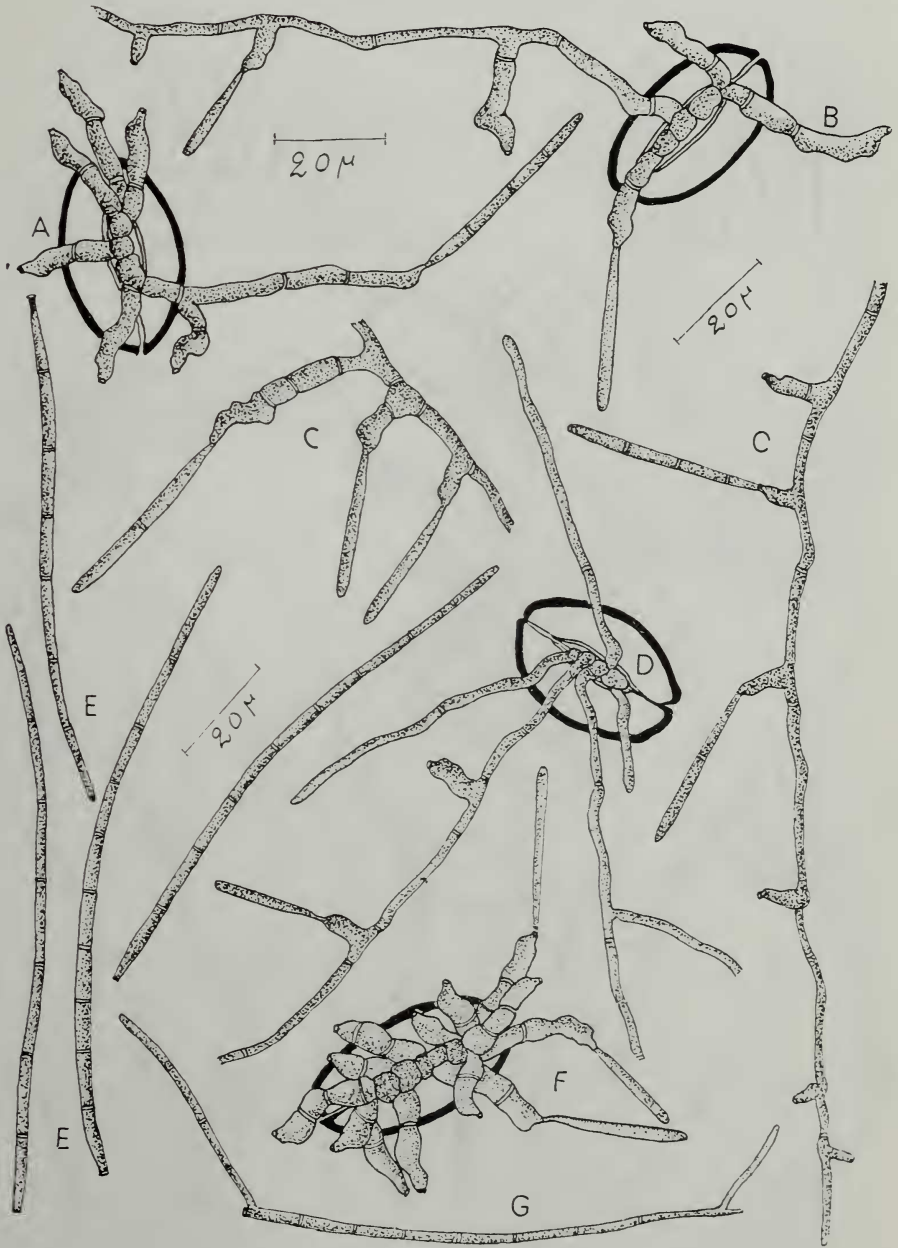


Fig. 64. *Pseudocercospora ubicola* (Yen) Deighton: A & F, fascicles of conidiophores; B, C & D, external hyphae and unbranched conidiophores; E, conidia.

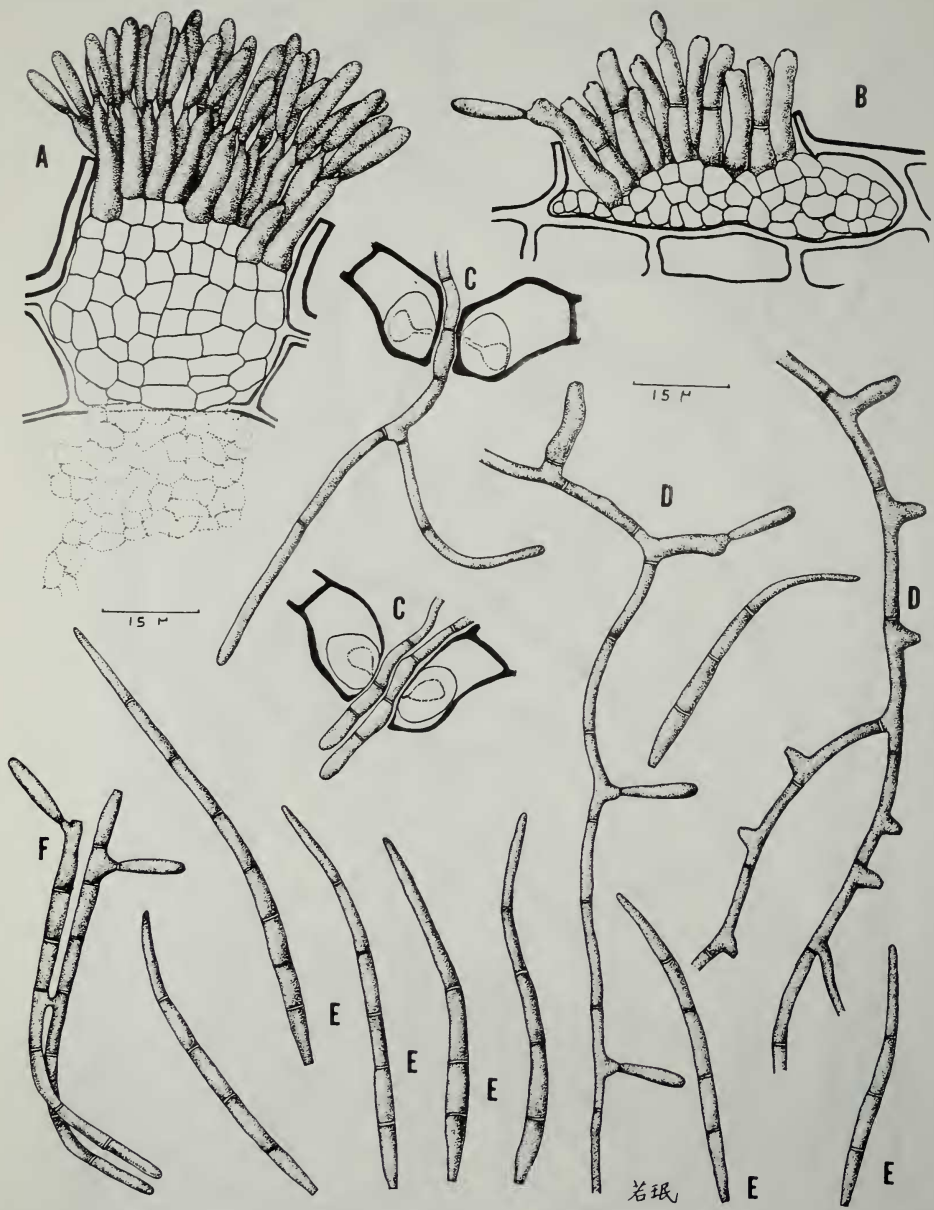


Fig. 65. *Pseudocercospora viticola* (Yen & Lim) Yen: A, fascicle of young conidiophores and stromata; B, fascicle of old conidiophores; C & D, external hyphae and unbranched conidiophores; E, conidia; F, germination of conidia.

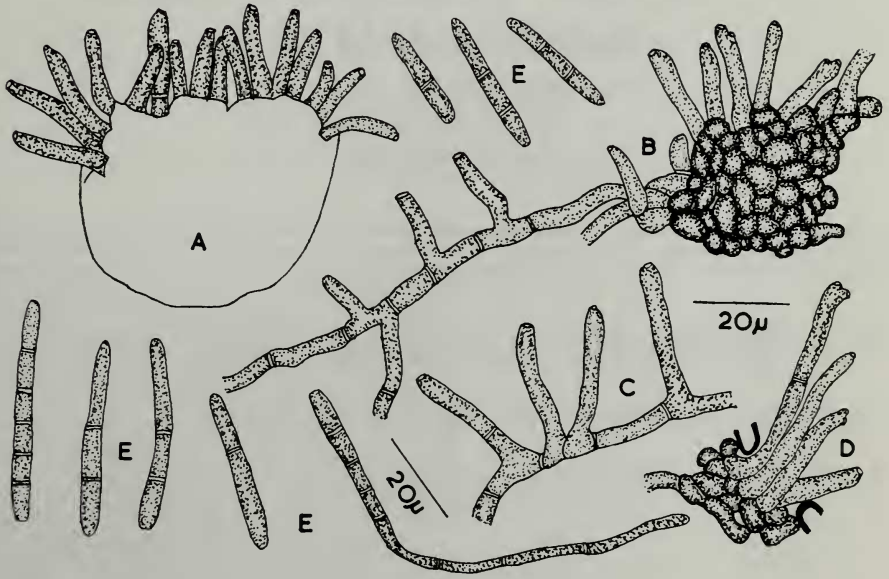


Fig. 66. *Stenella fagraeae* Yen: A & D, fascicles of conidiophores and stromata; B, stromata and formation of external hyphae; C, external hyphae and unbranched conidiophores; E, conidia.